Registered at the G.P.O., Sydney, for Transmission by Post as a Newspaper. Published Weekly.

THE

MEDICAL JOURNAL OF AUSTRALIA

(With which "The Australasian Medical Gazette," and "The Australian Medical Journal" are incorporated.)

The Journal of the Australian Branches of the British Medical Association.

VOL. I.—8TH YEAR—NO. 16. SYDNEY: SATURDAY, APRIL 16, 1921. PRICE 1s.

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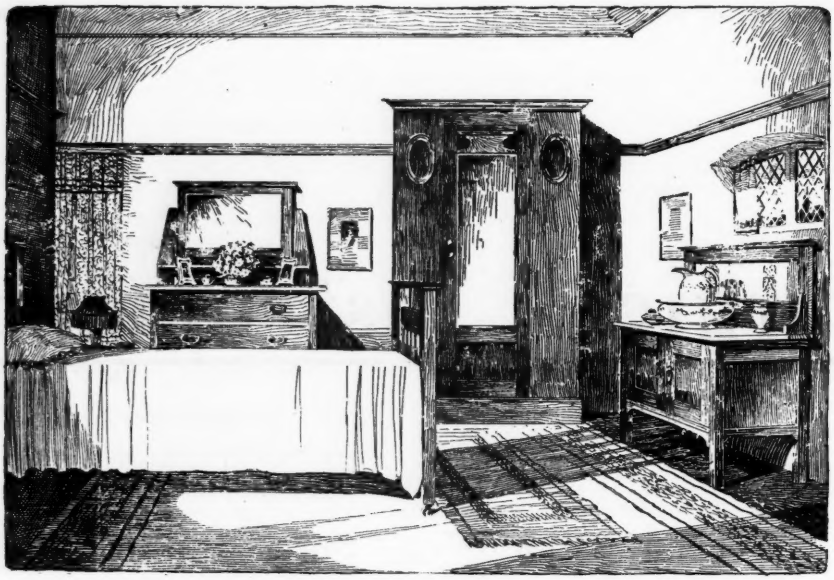

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THE MEDICAL JOURNAL OF AUSTRALIA.

VOL. I.—8TH YEAR. SYDNEY: SATURDAY, APRIL 16, 1921. No. 16.

AN INQUIRY INTO THE EFFECT OF HIGH WET BULB TEMPERATURES UPON THE PULSE RATE, RECTAL TEMPERATURE, SKIN-SHIRT TEMPERATURE AND BLOOD PRESSURE OF WHARF LABOURERS IN NORTH QUEENSLAND.

By **A. Breinl,**

From the Australian Institute of Tropical Medicine, Townsville.

For life in the tropics the physiological response of the warm blooded animal organism to the increased external temperature is of the greatest practical interest and importance. Under normal conditions the temperature equilibrium is maintained by heat production and heat loss; the former is brought about by chemical means, namely, by the combustion of food material in the body, the latter by physical means, namely, by radiation and convection and by evaporation of sweat. Radiation and convections, however, play a comparatively unimportant rôle in the heat regulating mechanism of the clothed human being in the tropics, where the outer temperature is high and frequently approaches that of the body; under these conditions the human organism relies for its cooling mainly on the heat loss due to the evaporation of sweat.

The study of the question of how far evaporation of sweat under varying conditions can compensate for the greatly decreased loss accounted for by convection and radiation is of scientific and of still greater practical interest for tropical colonization.

Haldane (1905) was the first to carry out systematic experiments in this direction by exposing men to different degrees of moist heat in artificially heated chambers and in deep mines, in still and in moving air. He observed that the temperature of the human body exposed to high temperatures began to rise after periods varying according to the individual, this rise corresponding to the rise in the wet bulb readings. He considered the critical temperature during complete rest to be 31.1° C. wet bulb. When the outer temperature rose higher, the rectal temperature began to rise, accompanied by an increase in the pulse rate, by profuse sweating and dyspnœa. During muscular exercise in still air the critical temperature was 27° C.; in moving air, however, higher temperatures were required to produce the same symptoms.

In Townsville similar experiments were carried out under natural and artificial conditions by Young, Breinl, Harris and Osborne. In general the results obtained under artificial conditions confirmed Haldane's observation.

For comparison experiments on the effects of exercise on hot summer days (wet bulb ranging between 24.5° and 27° C.) were carried out. The exercise consisted in hill climbing and walking on the flat at a pace of about four miles per hour. The rectal temperature rose considerably during the first half hour or so and afterwards either remained stationary or continued to rise gradually. A body temperature of 38.8° to 39.4° C. was not a rare occurrence after walking from 33 minutes to two hours at a normal pace. The blood pressure as a rule showed an initial sharp rise and afterwards in some instances remained stationary, but more often fell gradually to the starting level or even below it. The pulse-rate rose rapidly at first, more gradually afterwards, but on several occasions showed a distinct fall.

The loss in weight owing to profuse sweating was considerable and amounted in one instance to nearly 4% of the body weight after a walk lasting 3½ hours.

In continuation of this work similar observations were carried out on men doing manual labour under natural conditions during the hot months in Townsville, the climatic conditions of which corresponds, according to Griffith Taylor (1918), to those in Calcutta, with the exception that the humidity is slightly lower.

The courtesy of the shipping companies and the members of the Waterside Workers' Union enabled me to collect pulse-rates, rectal temperatures, skin shirt temperatures and systolic and diastolic blood pressure of groups of men working cargo in the ships' holds on the wharf. At the same time, the atmospheric conditions were estimated by utilizing dry and wet bulb thermometer and dry and wet bulb katathermometer readings. The katathermometer is an instrument designed by Leonard Hill primarily for the measurements of its own rate of cooling when its temperature approximates to that of the body temperature; the time in seconds is estimated in which the dry and wet katathermometer take to cool from 43.3° C. to 37.7° C. and again from 37.7° C. to 32.2° C.. The katathermometer readings are the averages calculated from a number of estimations. On account of the slow cooling rate of the dry katathermometer, the time has been estimated which it takes to cool from 43.3° C. to 37.7° C., whereas for the wet katathermometer both the time taken to cool from 43.3° to 37.7° C. and from 37.7° to 32.2° C. has been tabulated.

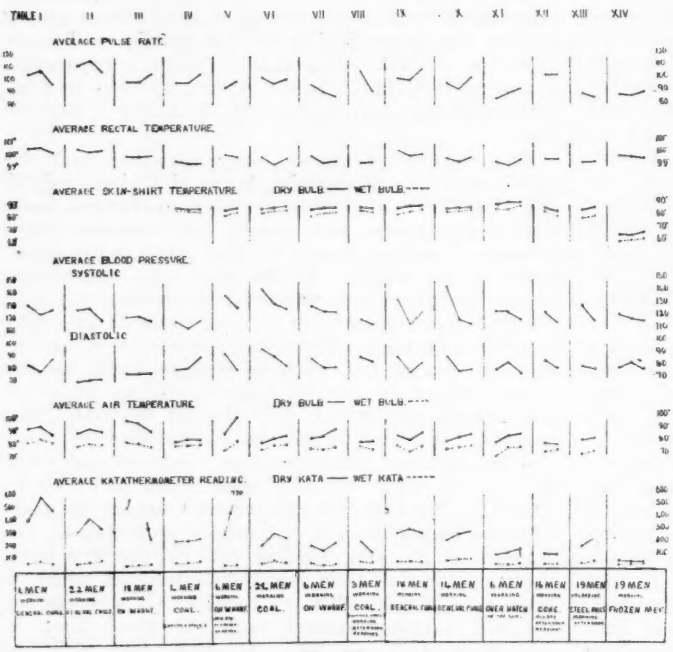
The blood pressure was taken by means of a Tyco's sphygmomanometer, which has been tested against a mercury manometer.

The skin shirt temperature constitutes the temperature of the air inside the clothing. There is invariably a layer of stagnant air of higher temperature and at a greater degree of saturation with moisture between the clothing and the skin. These temperatures have been taken by means of two ordinary thermometers, the mercury end of one of them wrapped up with a piece of moist fabric and both protected by means of a wire cage which prevented a direct contact with the skin.

All the body temperatures recorded in the following pages are rectal temperatures, since mouth temperatures are unreliable for estimating the actual internal temperature of the body. The observations were carried out in the places where the work was in progress, the men interrupting their work for the space of time required by the investigation. The time of taking

the observations had to conform with the working hours; the men as a rule start work at 8 o'clock in the morning and have their dinner hour between one and two o'clock. As far as possible three readings were taken, the first at about 8.30 a.m., the second towards mid-day and the third in the afternoon; in some instances, for other reasons, only two readings could be obtained.

In all about 180 men were thus examined in groups varying from three to twenty-four; for comparison similar observations were carried out on men loading frozen meat at a temperature below freezing point. As might be expected, the men on the latter occasion were heavily clad, wearing warm underclothing and had their boots tied up with sacking. The individual figures obtained have been compiled in form of tables



GRAPH I.

(Table I. to XIV.). From these tables averages were calculated and graphically represented (see Graph I.).

It was assumed that even considering the individual variations any constant tendency to change in the physiological functions under investigation, would find a clear expression in the total averages.

The graphs have been arranged according to the degree of wet bulb temperatures of the air, which varied between 28.8° C. and 21.6° C.; the results obtained at the highest wet bulb readings are presented in the beginning of the graph and the last set of curves represents the results of the examination of 19 men working below freezing point. It is of interest to note that variations are less pronounced in the average wet bulb katathermometer readings than in the dry katathermometer readings. The tables are numbered in the same sequence. The readings of the dry and wet bulb thermometers and of the katathermometers invariably represented the average of a number of readings. The ages of the men varied from about 24 to 62 and quite a number of them had followed the occupation of wharf labourers for a great number of year. All of the men included in the 14 groups carried out the same type of labour; they either worked general cargo, which consists in moving the cases, etc., into a sling, securing it and getting the sling or parachute ready for being lifted up or shovelled coal or coke into baskets holding about 250 kilograms of coal; the men on the wharf received the cargo out of the sling or parachute, put it on trucks and wheeled it into the shed, where it is stacked.

The work on the whole can be considered heavy manual labour and, according to an average estimate, each man handles about 2,000 kilograms per hour.

The men on hot days (wet bulb temperature 26.5° C. and over) were only clad in a pair of trousers, boots and a hat, when working fully exposed to the sun, and had their upper body naked; on cooler days the majority wore either a heavy flannel or a cotton singlet; the men on the wharf were invariably dressed in singlet and trousers and boots.

A consideration of the detailed tables reveals that individual differences in respect of pulse rate, rectal temperature and blood pressure were well marked, whereas the skin shirt temperature did not show such pronounced variations.

Pulse Rate.

With increased wet bulb temperature the pulse rate was higher. On the hottest days the pulse rate rose at mid-day, but fell again in the afternoon, whereas during the somewhat cooler days there was a slight fall towards mid-day and a rise again in the afternoon; on cool days (12 and 13) the average pulse rate remained fairly constant.

Body Temperature.

The rectal temperature, like the pulse rate, showed a general tendency to be at a higher level with increased wet bulb temperature and rectal temperatures in the vicinity of 38.3° C. are quite of usual occurrence on hot days, but are hardly ever registered on cool days. Generally towards midday the average temperature fell slightly, but rose again in the afternoon to the level observed in the morning.

The skin shirt temperature (wet and dry bulb) were closer together on a hot day; in other words, the men were working in a more humid atmosphere, the layer of the air between skin and clothing being nearly saturated with moisture and was higher in men working exposed to the sun (Table VII. and XI.). In spite of the much heavier clothing the skin shirt temperature of the men working in the refrigerating chamber was nearly 10° below that of the men working exposed to the heat of the day.

The blood pressure on the whole was not affected in a constant way by the level of the wet bulb readings. Towards mid-day the systolic blood pressure was nearly always lower than in the morning, but

TABLE I.—SIX MEN WORKING GENERAL CARGO.

Note.—In this and subsequent tables, temperatures are given in the Fahrenheit scale instead of the Centigrade scale.

Pulse Rate.			Rectal Temperature.			Blood Pressure.					
						Systolic.			Diastolic.		
Morning.	Noon.	Afternoon.	Morning. F.	Noon. F.	Afternoon. F.	Morning. mm.	Noon. mm.	Afternoon. mm.	Morning. mm.	Noon. mm.	Afternoon. mm.
104	116	96	101.8°	101.7°	100.0°	150	138	143	84	80	100
84	84	96	100.7°	100.6°	100.6°	124	120	132	90	70	95
100	108	72	99.9°	100.2°	100.5°	150	138	120	100	100	90
112	112	112	100.4°	100.2°	99.5°	104	112	120	60	80	78
112	108	100	100.7°	100.7°	100.2°	140	116	132	92	66	84
124	124	112	100.7°	100.6°	100.7°	124	124	120	80	80	90
Avg. 106	109	98	100.7°	100.7°	100.3°	132	125	128	84	79	89

Average Air Temperature.

	Dry Bulb. F.	Wet Bulb. F.
Morning	93.8°	82.6°
Noon	95.5°	85.8°
Afternoon	88.2°	82.6°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	411 seconds	79 seconds	149 seconds
Noon	598 seconds	88 seconds	168 seconds
Afternoon	490 seconds	68 seconds	128 seconds

TABLE II.—TWENTY-TWO MEN WORKING GENERAL CARGO.

Pulse Rate.			Rectal Temperature.			Blood Pressure.					
						Systolic.			Diastolic.		
Morning.	Noon.	Afternoon.	Morning. F.	Noon. F.	Afternoon. F.	Morning. mm.	Noon. mm.	Afternoon. mm.	Morning. mm.	Noon. mm.	Afternoon. mm.
120	148	96	100.7°	101.4°	101.8°	128	100	140	90	60	60
104	128	120	100.2°	100.1°	99.8°	130	145	120	80	70	70
66	84	90	100.0°	100.5°	100.7°	120	120	144	70	80	90
156	128	126	100.7°	100.7°	101.7°	118	180	128	60	80	80
114	72	108	99.7°	99.7°	100.6°	112	112	100	70	60	70
126	152	124	100.3°	101.6°	101.7°	138	130	110	90	90	50
102	104	102	100.1°	100.3°	100.0°	130	138	100	70	72	50
108	114	108	101.4°	100.5°	100.2°	149	128	124	60	60	78
114	96	108	100.6°	100.2°	100.2°	151	126	124	60	60	78
102	96	90	100.6°	99.6°	100.3°	121	86	104	65	—	60
123	102	96	100.4°	99.6°	100.4°	125	134	120	75	80	70
84	84	90	100.1°	99.6°	100.6°	128	128	108	50	70	72
112	128	102	100.9°	100.5°	100.3°	119	131	130	60	60	70
116	116	126	100.4°	100.5°	100.7°	143	141	128	80	63	80
124	132	120	100.7°	100.5°	100.2°	108	110	98	74	70	60
120	120	120	100.4°	100.2°	100.1°	153	120	96	60	73	60
100	108	96	100.9°	100.6°	100.2°	119	128	98	60	80	60
104	138	96	100.2°	100.0°	100.3°	134	130	124	90	73	80
84	120	114	—	—	—	122	110	110	70	60	70
128	132	114	—	100.5°	100.1°	145	154	142	90	90	98
155	138	126	101.2°	100.9°	100.5°	130	154	164	90	88	110
128	128	108	101.7°	101.1°	100.6°	104	130	122	50	78	70
Avg. 113	117	108	100.6°	100.4°	100.5°	128	129	119	71	72	72

Average Air Temperature.

	Dry Bulb. F.	Wet Bulb. F.
Morning	90.1°	79.9°
Noon	93.0°	81.8°
Afternoon	90.9°	80.9°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	308 seconds	64 seconds	120 seconds
Noon	426 seconds	72 seconds	143 seconds
Afternoon	339 seconds	79 seconds	142 seconds

TABLE III.—EIGHTEEN MEN WORKING ON WHARF.

Pulse Rate.			Rectal Temperature.			Blood Pressure.					
						Systolic.			Diastolic.		
Morning.	Noon.	Afternoon.	Morning. F.	Noon. F.	Afternoon. F.	Morning. mm.	Noon. mm.	Afternoon. mm.	Morning. mm.	Noon. mm.	Afternoon. mm.
104	92	104	99.7°	99.7°	100.2°	134	102	124	82	82	80
104	96	116	100.0°	100.3°	100.7°	128	112	110	70	60	50
78	104	100	100.2°	99.7°	100.1°	144	160	140	92	90	105
116	92	100	99.6°	99.6°	99.8°	154	130	142	100	80	105
124	100	120	99.2°	99.4°	99.4°	124	120	136	66	60	100
92	92	116	100.0°	100.4°	100.7°	132	124	139	84	85	80
128	100	100	100.7°	99.0°	100.3°	116	130	120	73	80	80
109	116	124	100.6°	100.6°	100.7°	112	132	122	70	90	70
112	100	112	101.2°	99.7°	100.7°	126	114	115	80	75	60
88	96	92	99.4°	99.2°	99.6°	100	110	104	74	84	50
112	112	112	99.4°	99.3°	99.5°	134	144	120	97	90	90
106	112	116	99.5°	100.0°	99.8°	100	114	112	50	80	80
96	100	100	100.0°	100.7°	100.1°	124	120	110	90	70	80
92	92	100	99.4°	99.5°	100.0°	106	100	102	70	70	68
100	116	104	101.2°	100.5°	100.7°	98	150	90	60	80	65
66	80	88	100.7°	100.2°	101.1°	124	104	116	90	60	75
96	124	116	100.4°	100.4°	100.8°	132	138	132	72	90	70
72	84	84	99.7°	99.6°	99.3°	107	104	114	74	60	86
Avg. 100	100	106	100.0°	99.8°	100.2°	122	123	119	77	77	77

Average Air Temperature.

	Dry Bulb. F.	Wet Bulb. F.
Morning	99.7°	82.6°
Noon	97.1°	81.6°
Afternoon	90.9°	79.0°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	496 seconds	48 seconds	124 seconds
Noon	—	53 seconds	124 seconds
Afternoon	249 seconds	56 seconds	110 seconds

TABLE IV.—FOUR MEN WORKING COAL.

Pulse Rate.			Rectal Temperature.			Blood Pressure.						Skin-Shirt Temperature.					
						Systolic.			Diastolic.			Dry Bulb.			Wet Bulb.		
Morn.	Noon.	A'noon.	Morn. F.	Noon. F.	A'noon. F.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. F.	Noon. F.	A'noon. F.	Morn. F.	Noon. F.	A'noon. F.
72	72	92	99.3°	99.1°	99.0°	100	100	120	60	74	92	89.4°	87.7°	85.7°	86.9°	85.5°	84.0°
100	104	96	100.0°	99.9°	99.1°	140	130	142	110	98	108	88.2°	88.2°	88.2°	87.8°	87.5°	85.7°
96	96	96	99.2°	99.3°	99.4°	100	110	100	60	80	70	88.4°	88.2°	89.8°	87.3°	88.2°	87.3°
128	124	140	99.8°	99.3°	99.8°	130	112	114	90	74	90	88.2°	86.4°	86.6°	86.6°	85.3°	86.2°
Av. 99	99	106	99.6°	99.4°	99.4°	118	113	119	80	81	90	88.6°	87.6°	87.6°	87.1°	86.6°	85.8°

Average Air Temperature.

	Dry Bulb. F.	Wet Bulb. F.
Morning	82.9°	79.4°
Noon	84.8°	80.3°
Afternoon	84.1°	80.5°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	235 seconds	65 seconds	114 seconds
Noon	237 seconds	68 seconds	123 seconds
Afternoon	244 seconds	76 seconds	132 seconds

TABLE V.—SIX MEN WORKING ON WHARF.

Pulse Rate.		Rectal Temperature.		Blood Pressure.				Skin-Shirt Temperature.			
				Systolic.		Diastolic.		Dry Bulb.		Wet Bulb.	
Morning.	Afternoon.	Morning. F.	Afternoon. F.	Morning. mm.	Afternoon. mm.	Morning. mm.	Afternoon. mm.	Morning. F.	Afternoon. F.	Morning. F.	Afternoon. F.
96	72	99.8°	99.6°	140	120	100	80	84.9°	86.2°	82.6°	81.5°
84	92	99.6°	99.7°	156	136	84	60	85.7°	89.4°	82.4°	87.7°
108	132	99.4°	100.1°	144	140	104	80	86.0°	89.8°	80.6°	85.9°
88	116	100.6°	99.3°	124	122	90	85	85.1°	87.8°	82.6°	85.3°
96	84	100.2°	99.9°	120	134	86	90	86.9°	87.7°	84.2°	83.7°
96	104	100.8°	100.8°	150	122	90	80	87.8°	87.8°	83.7°	85.9°
Avg. 95	100	100.1°	99.9°	139	129	92	79	86.1°	88.1°	82.7°	85.0°

Average Air Temperature.

	Dry Bulb. F.	Wet Bulb. F.
Morning	88.6°	75.2°
Afternoon	102.1°	82.8°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	286 seconds	45 seconds	143 seconds
Afternoon	770 seconds	46 seconds	68 seconds

TABLE VI.—TWENTY-FOUR MEN WORKING COAL.

Pulse Rate.			Rectal Temperature.			Blood Pressure.						Skin-Shirt Temperature.					
						Systolic.			Diastolic.			Dry Bulb.			Wet Bulb.		
Morn.	Noon.	A'noon.	Morn. F.	Noon. F.	A'noon. F.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. F.	Noon. F.	A'noon. F.	Morn. F.	Noon. F.	A'noon. F.
88	84	80	100.3°	99.3°	99.4°	129	138	126	90	90	90	87.5°	85.5°	89.8°	86.0°	82.2°	85.3°
108	88	104	99.8°	100.4°	100.6°	142	140	150	100	100	100	86.0°	89.2°	89.2°	82.6°	86.8°	85.1°
124	100	128	99.7°	99.2°	100.1°	160	124	145	80	88	85	84.8°	89.6°	89.8°	82.0°	85.7°	86.2°
112	88	108	100.3°	99.0°	99.7°	134	114	142	95	60	100	86.9°	88.2°	89.6°	85.7°	85.3°	85.9°
128	104	112	100.8°	99.6°	101.2°	132	104	102	80	65	50	89.0°	88.6°	89.4°	89.0°	86.6°	87.8°
120	112	112	100.1°	99.0°	100.1°	112	126	92	72	70	54	87.8°	89.2°	89.4°	86.6°	86.9°	86.6°
84	84	84	100.8°	99.4°	99.1°	178	160	124	140	115	80	88.4°	90.7°	92.3°	86.0°	88.0°	89.8°
140	116	120	100.5°	99.0°	100.2°	184	158	126	132	130	70	88.2°	90.0°	90.9°	86.9°	88.0°	89.0°
92	92	88	99.2°	98.1°	99.3°	150	120	122	120	70	60	86.2°	89.4°	91.2°	85.1°	87.3°	88.4°
92	80	84	99.6°	99.2°	99.2°	150	134	102	100	76	64	88.0°	88.4°	90.9°	87.3°	86.9°	88.7°
112	112	108	100.2°	99.1°	99.6°	158	138	104	120	105	65	87.3°	89.2°	90.7°	86.0°	84.4°	87.3°
96	84	104	99.9°	99.3°	99.7°	175	156	124	120	120	86	86.6°	88.0°	89.8°	86.2°	84.0°	87.1°
120	108	96	99.0°	99.6°	99.8°	156	140	152	96	100	100	87.8°	90.2°	88.2°	83.1°	84.4°	86.0°
108	104	92	99.8°	99.7°	99.3°	126	118	146	84	90	100	84.2°	88.0°	86.4°	81.8°	84.4°	83.0°
92	92	100	99.9°	99.6°	99.8°	172	170	150	120	120	104	87.8°	88.4°	87.1°	86.4°	85.1°	84.2°
72	88	80	99.3°	99.9°	99.3°	136	132	130	100	94	80	86.2°	88.4°	87.8°	83.9°	86.2°	85.5°
92	84	92	99.8°	99.6°	100.2°	158	120	148	90	90	100	86.6°	88.4°	88.0°	85.5°	84.9°	87.3°
92	80	126	99.8°	98.4°	99.2°	110	116	132	84	70	80	86.6°	87.7°	86.9°	82.6°	83.0°	84.0°
92	96	92	99.7°	99.4°	100.1°	122	110	124	80	74	80	86.2°	87.8°	89.2°	84.8°	85.9°	81.8°
124	114	108	99.8°	99.4°	100.0°	134	121	104	76	80	70	88.2°	89.0°	89.6°	85.3°	86.4°	87.5°
108	104	96	99.8°	99.5°	99.9°	144	140	144	110	100	95	85.1°	88.7°	88.6°	80.0°	87.1°	87.3°
104	90	100	100.1°	99.6°	100.5°	150	160	148	70	120	100	86.2°	88.7°	87.7°	81.8°	86.9°	84.4°
108	128	108	99.3°	99.8°	99.5°	162	152	150	96	96	94	87.3°	88.0°	88.0°	81.6°	84.8°	86.0°
72	84	88	99.4°	98.8°	99.5°	84	76	98	50	48	60	90.5°	88.4°	89.6°	85.7°	85.7°	88.0°
Av.103	98	101	99.9°	99.3°	99.8°	144	132	128	96	90	82	87.1°	88.7°	89.2°	84.6°	85.7°	86.4°

Average Air Temperature.

	Dry Bulb. F.	Wet Bulb. F.
Morning	81.5°	76.3°
Noon	84.3°	79.2°
Afternoon	86.6°	79.7°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	193 seconds	53 seconds	83 seconds
Noon	294 seconds	75 seconds	138 seconds
Afternoon	257 seconds	69 seconds	118 seconds

TABLE VII.—SIX MEN WORKING ON WHARF.

Pulse Rate.			Rectal Temperature.			Blood Pressure.						Skin-Shirt Temperature.					
						Systolic.			Diastolic.			Dry Bulb.			Wet Bulb.		
Morn.	Noon.	A'noon.	Morn. F.	Noon. F.	A'noon. F.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. F.	Noon. F.	A'noon. F.	Morn. F.	Noon. F.	A'noon. F.
96	96	84	100.1°	100.3°	100.2°	112	84	100	80	56	70	84.2°	86.2°	85.5°	78.8°	78.8°	79.7°
108	72	84	99.5°	98.6°	99.2°	158	150	140	100	90	92	84.6°	86.2°	88.0°	79.2°	82.0°	84.6°
100	116	84	99.5°	99.1°	99.2°	126	152	140	80	100	92	84.2°	87.8°	88.0°	78.4°	81.8°	84.6°
84	80	84	100.6°	99.5°	99.4°	154	124	140	100	60	90	84.4°	—	85.7°	78.6°	—	79.0°
84	76	76	99.4°	99.5°	99.4°	122	140	128	100	100	80	84.6°	88.2°	80.8°	78.6°	80.0°	78.8°
108	108	108	100.0°	99.2°	99.7°	108	108	102	70	80	60	86.6°	88.0°	86.9°	80.8°	81.0°	80.8°
Av. 97	91	87	99.8°	99.4°	99.5°	130	126	125	88	81	81	86.6°	88.6°	88.1°	81.8°	83.6°	84.4°

Average Air Temperature.

	Dry Bulb.	Wet Bulb.
	F.	F.
Morning	84.1°	76.5°
Noon	86.1°	75.8°
Afternoon	92.0°	77.8°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	194 seconds	51 seconds	81 seconds
Noon	155 seconds	40 seconds	61 seconds
Afternoon	217 seconds	47 seconds	84 seconds

TABLE VIII.—THREE MEN WORKING COAL.

Pulse Rate.		Rectal Temperature.		Blood Pressure.				Skin-Shirt Temperature.			
				Systolic.		Diastolic.		Dry Bulb.		Wet Bulb.	
Morning.	Afternoon.	Morning. F.	Afternoon. F.	Morning. mm.	Afternoon. mm.	Morning. mm.	Afternoon. mm.	Morning. F.	Afternoon. F.	Morning. F.	Afternoon. F.
96	92	99.1°	99.6°	102	117	78	80	86.9°	88.2°	85.9°	85.1°
100	84	99.5°	99.2°	130	112	102	90	88.6°	84.4°	87.1°	82.6°
128	96	99.6°	99.3°	124	116	86	86	89.2°	88.7°	86.6°	86.8°
Avg. 108	91	99.4°	99.4°	119	115	89	85	88.2°	87.1°	86.5°	84.8°

Average Air Temperature.

	Dry Bulb.	Wet Bulb.
	F.	F.
Morning	81.8°	78.0°
Afternoon	81.7°	75.7°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	244 seconds	69 seconds	117 seconds
Afternoon	135 seconds	57 seconds	92 seconds

TABLE IX.—EIGHTEEN MEN WORKING GENERAL CARGO.

Pulse Rate.			Rectal Temperature.			Blood Pressure.						Skin-Shirt Temperature.					
						Systolic.			Diastolic.			Dry Bulb.			Wet Bulb.		
Morn.	Noon.	A'noon.	Morn. F.	Noon. F.	A'noon. F.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. F.	Noon. F.	A'noon. F.	Morn. F.	Noon. F.	A'noon. F.
124	112	112	100.0°	100.1°	99.9°	114	124	120	85	90	82	87.8°	88.2°	90.4°	86.2°	82.4°	87.8°
96	100	120	99.8°	99.7°	100.3°	140	122	120	90	90	90	89.6°	88.0°	91.4°	86.9°	83.7°	86.0°
86	88	88	100.7°	100.2°	99.9°	110	108	140	60	60	100	86.9°	88.2°	—	82.4°	85.3°	—
72	64	92	100.2°	99.4°	100.7°	114	100	124	85	70	80	87.5°	86.4°	89.6°	83.0°	81.5°	83.7°
128	104	124	100.4°	100.1°	101.3°	146	112	115	112	86	80	87.3°	88.7°	90.0°	82.6°	82.4°	84.4°
84	88	116	99.4°	99.6°	99.9°	138	130	142	100	80	90	—	—	—	—	—	—
96	96	100	100.3°	99.7°	101.7°	149	102	134	110	70	70	86.0°	86.9°	86.6°	81.6°	82.2°	81.8°
100	96	100	100.8°	100.4°	100.5°	138	120	130	100	80	64	—	—	—	—	—	—
116	108	108	100.7°	99.3°	100.3°	122	112	100	80	70	60	—	—	89.2°	—	—	84.0°
132	140	132	101.7°	100.0°	100.9°	120	106	92	96	50	70	86.0°	88.0°	89.0°	82.4°	83 9°	84.2°
100	88	104	100.5°	99.2°	100.9°	140	124	130	85	70	100	—	—	—	—	—	—
120	104	112	101.6°	99.9°	99.8°	129	124	126	90	90	90	—	—	—	—	—	—
92	108	108	100.5°	100.5°	100.7°	140	120	138	105	80	100	86.8°	92.1°	88.6°	80.6°	88.4°	86.6°
92	96	120	100.5°	100.8°	101.4°	140	112	139	105	80	110	86.8°	90.9°	88.7°	80.6°	87.1°	88.4°
100	108	—	100.6°	99.8°	—	130	104	—	70	80	—	87.8°	90.0°	—	83.3°	84.8°	—
108	92	100	99.6°	99.3°	98.4°	160	120	130	108	80	90	88.0°	89.2°	88.4°	84.0°	83.9°	87.3°
92	108	108	100.2°	100.5°	100.6°	164	130	110	120	90	70	88.0°	90.0°	89.8°	82.6°	87.5°	89.0°
92	108	116	100.6°	99.6°	100.3°	126	96	128	94	50	84	89.0°	91.6°	89.4°	84.6°	88.4°	88.0°
Av.102	100	109	100.4°	99.9°	100.4°	135	115	125	89	76	84	87.5°	89.1°	89.2°	83.1°	84.7°	86.1°

Average Air Temperature.

	Dry Bulb. F.	Wet Bulb. F.
Morning	86.9°	78.2°
Noon	82.9°	73.9°
Afternoon	88.3°	77.3°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	283 seconds	69 seconds	129 seconds
Noon	321 seconds	66 seconds	122 seconds
Afternoon	285 seconds	62 seconds	77 seconds

TABLE X.—FOURTEEN MEN WORKING GENERAL CARGO.

Pulse Rate.			Rectal Temperature.			Blood Pressure.						Skin-Shirt Temperature.					
						Systolic.			Diastolic.			Dry Bulb.			Wet Bulb.		
Morn.	Noon.	A'noon.	Morn. F.	Noon. F.	A'noon. F.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. F.	Noon. F.	A'noon. F.	Morn. F.	Noon. F.	A'noon. F.
92	80	100	100.5°	100.0°	100.0°	168	144	95	102	80	60	85.3°	87.1°	86.9°	84.2°	84.9°	84.2°
88	72	92	100.3°	99.6°	100.4°	118	110	111	80	67	70	85.7°	87.8°	88.2°	83.7°	86.2°	85.9°
76	68	84	100.1°	99.8°	99.4°	150	122	136	100	86	94	86.6°	88.4°	87.3°	84.2°	87.5°	84.4°
132	132	125	98.6°	98.4°	99.8°	160	130	110	120	84	75	88.0°	88.0°	88.0°	85.7°	85.5°	86.4°
88	96	88	100.0°	99.8°	99.6°	188	140	140	110	110	110	86.2°	87.1°	86.2°	84.0°	85.9°	83.9°
108	105	112	100.3°	99.2°	100.2°	178	110	140	112	66	114	89.6°	88.0°	88.0°	85.7°	85.9°	84.0°
116	108	124	99.6°	99.4°	100.7°	142	132	124	80	100	90	86.2°	86.2°	87.1°	82.8°	82.4°	85.7°
96	100	124	99.5°	99.6°	100.7°	140	110	124	70	80	90	86.0°	85.9°	87.1°	83.9°	81.3°	85.7°
88	88	92	99.8°	99.0°	99.2°	120	102	104	70	40	50	85.3°	88.0°	86.0°	83.0°	83.9°	84.0°
84	80	96	99.8°	99.8°	100.2°	143	124	104	90	60	70	87.8°	88.0°	88.0°	85.5°	84.2°	86.4°
88	92	104	100.0°	100.2°	100.6°	134	100	110	74	60	60	86.4°	88.0°	88.7°	85.1°	86.8°	86.4°
92	76	100	99.4°	98.8°	99.2°	106	108	106	60	80	60	87.3°	86.4°	88.0°	85.7°	85.5°	86.4°
128	124	116	98.4°	98.4°	99.0°	176	114	112	100	80	84	87.5°	86.8°	89.8°	85.1°	83.7°	86.6°
84	76	76	99.0°	99.4°	98.6°	104	120	94	80	92	65	89.6°	88.0°	87.8°	86.9°	85.7°	85.1°
Av. 97	93	102	99.7°	99.4°	99.8°	145	119	115	89	77	78	87.0°	87.4°	87.7°	84.7°	84.9°	85.4°

Average Air Temperature.

	Dry Bulb. F.	Wet Bulb. F.
Morning	81.4°	75.2°
Noon	84.2°	76.4°
Afternoon	86.5°	77.7°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	229 seconds	65 seconds	112 seconds
Noon	276 seconds	72 seconds	130 seconds
Afternoon	291 seconds	72 seconds	121 seconds

TABLE XI.—SIX MEN WORKING OVER HATCH.

Pulse Rate.			Rectal Temperature.			Blood Pressure.						Skin-Shirt Temperature.					
						Systolic.			Diastolic.			Dry Bulb.			Wet Bulb.		
Morn.	Noon.	A'noon.	Morn. F.	Noon. F.	A'noon. F.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. F.	Noon. F.	A'noon. F.	Morn. F.	Noon. F.	A'noon. F.
84	76	92	99.6°	99.5°	100.2°	126	134	140	70	100	100	89.0°	91.6°	91.6°	85.5°	87.7°	90.0°
88	88	92	99.6°	99.2°	99.2°	120	120	110	60	90	70	90.2°	92.0°	91.4°	85.9°	87.3°	88.9°
84	92	80	99.5°	99.1°	99.6°	116	124	102	80	80	70	91.4°	91.6°	92.8°	86.6°	86.2°	89.0°
92	96	96	99.4°	98.4°	99.7°	97	112	104	60	80	66	91.2°	90.7°	91.6°	87.5°	83.7°	89.0°
72	80	88	99.0°	99.2°	99.0°	144	122	114	100	70	70	91.2°	91.4°	91.4°	87.3°	85.1°	89.0°
88	100	108	99.6°	99.3°	100.2°	147	134	136	100	85	76	90.5°	91.1°	90.2°	86.2°	88.2°	87.7°
Av. 85	89	93	99.4°	99.1°	99.6°	125	124	118	78	84	75	90.6°	91.4°	91.5°	86.5°	86.4°	88.9°

Average Air Temperature.

	Dry Bulb.	Wet Bulb.
	F.	F.
Morning	80.0°	69.5°
Noon	85.6°	76.6°
Afternoon	86.5°	76.2°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Morning	112 seconds	35 seconds	49 seconds
Noon	123 seconds	32 seconds	57 seconds
Afternoon	157 seconds	41 seconds	53 seconds

TABLE XII.—SIXTEEN MEN WORKING COKE.

Pulse Rate.		Rectal Temperature.		Blood Pressure.				Skin-Shirt Temperature.			
				Systolic.		Diastolic.		Dry Bulb.		Wet Bulb.	
Noon.	Afternoon.	Noon. F.	Afternoon. F.	Noon. mm.	Afternoon. mm.	Noon. mm.	Afternoon. mm.	Noon. F.	Afternoon. F.	Noon. F.	Afternoon. F.
96	108	99.2°	100.0°	158	154	116	120	83.0°	81.3°	80.8°	77.2°
88	92	98.6°	99.1°	98	90	78	54	84.9°	84.6°	83.5°	79.2°
124	112	99.6°	99.0°	114	110	80	70	86.8°	85.7°	85.1°	82.0°
104	116	99.8°	99.7°	108	132	70	100	88.0°	85.9°	86.4°	81.0°
88	80	99.4°	99.7°	134	134	90	108	84.8°	84.4°	81.8°	79.2°
108	112	98.2°	99.6°	120	112	92	54	82.8°	83.9°	81.0°	79.7°
104	96	100.2°	99.6°	112	98	74	60	88.2°	84.0°	86.2°	80.0°
132	116	100.0°	99.4°	120	120	80	70	88.0°	85.9°	86.0°	81.8°
76	80	99.4°	99.2°	138	104	103	76	88.0°	83.5°	87.8°	77.6°
104	92	99.4°	99.0°	114	110	90	72	85.9°	82.6°	83.7°	77.7°
132	104	100.4°	99.5°	106	122	62	80	88.2°	83.0°	85.9°	80.2°
96	92	100.3°	100.2°	132	120	90	82	87.5°	85.1°	85.9°	82.0°
100	96	99.1°	99.8°	154	144	100	84	88.0°	85.5°	86.2°	83.1°
124	116	100.0°	100.5°	122	110	80	64	86.2°	84.8°	83.9°	81.6°
112	116	99.4°	99.6°	110	102	82	54	84.6°	84.4°	83.1°	82.2°
84	116	100.0°	99.0°	142	102	70	54	88.4°	84.4°	85.9°	82.2°
Avg. 104	103	99.6°	99.6°	124	116	85	75	86.5°	84.3°	84.6°	80.4°

Average Air Temperature.

	Dry Bulb.	Wet Bulb.
	F.	F.
Noon	79.1°	72.2°
Afternoon	78.1°	74.2°

Average Katathermometer Readings.

	Dry Bulb.	Wet Bulb.	
	110°-100° F.	110°-100° F.	100°-90° F.
Noon	114 seconds	37 seconds	56 seconds
Afternoon	114 seconds	37 seconds	54 seconds

TABLE XIII.—NINETEEN MEN UNLOADING STEEL RAILS.

Pulse Rate.		Rectal Temperature.		Blood Pressure.				Skin-Shirt Temperature.			
				Systolic.		Diastolic.		Dry Bulb.		Wet Bulb.	
Morning.	Afternoon.	Morning. F.	Afternoon. F.	Morning. mm.	Afternoon. mm.	Morning. mm.	Afternoon. mm.	Morning. F.	Afternoon. F.	Morning. F.	Afternoon. F.
100	72	99.8°	99.6°	114	104	60	50	86.0°	86.2°	82.6°	77.4°
100	96	99.7°	98.6°	138	102	86	74	86.9°	86.2°	82.0°	77.0°
96	102	99.9°	99.3°	132	104	90	65	85.1°	86.4°	80.4°	82.4°
76	76	99.6°	98.8°	132	130	90	100	85.1°	89.4°	77.6°	81.8°
104	80	98.8°	99.2°	140	110	100	80	86.2°	90.5°	78.6°	81.8°
100	96	99.1°	99.0°	146	139	105	106	86.6°	88.7°	81.1°	79.5°
92	84	99.3°	99.3°	118	108	80	60	85.7°	89.0°	78.2°	82.8°
88	88	99.1°	99.6°	140	104	95	78	84.4°	87.1°	77.0°	78.4°
80	80	99.5°	99.7°	120	128	90	90	85.7°	86.4°	76.6°	76.4°
100	88	98.6°	99.6°	115	104	70	78	84.6°	87.1°	79.0°	78.4°
64	64	99.9°	99.8°	114	126	110	110	85.1°	86.4°	82.6°	84.4°
92	88	100.7°	100.7°	152	128	100	95	86.9°	88.0°	81.1°	80.4°
80	84	99.7°	98.6°	122	122	80	70	86.8°	88.6°	81.5°	82.2°
80	84	99.2°	99.9°	123	98	60	52	88.4°	88.7°	81.3°	81.8°
72	84	98.4°	99.7°	174	166	106	94	86.0°	87.3°	79.4°	80.8°
80	76	98.6°	99.5°	112	122	70	80	86.4°	89.8°	78.8°	85.5°
100	104	98.7°	99.6°	124	130	90	102	85.1°	89.4°	80.2°	85.1°
100	112	100.2°	99.5°	110	94	74	50	86.0°	89.8°	79.0°	82.4°
80	64	99.3°	98.6°	138	102	90	60	84.8°	87.3°	77.9°	80.4°
Avg. 89	86	99.4°	99.4°	130	117	81	79	85.9°	88.0°	79.7°	80.9°

Average Air Temperature.

	Dry Bulb. F.	Wet Bulb. F.
Morning	82.2°	71.0°
Afternoon	83.6°	73.4°

Average Katathermometer Readings.

	Dry Bulb. 110°-100° F.	Wet Bulb. 110°-100° F.	Wet Bulb. 100°-90° F.
Morning	172 seconds	47 seconds	68 seconds
Afternoon	233 seconds	56 seconds	83 seconds

TABLE XIV.—FROZEN MEAT SHIP (NINETEEN MEN).

Pulse Rate.			Rectal Temperature.			Blood Pressure.						Skin-Shirt Temperature.					
						Systolic.			Diastolic.			Dry Bulb.			Wet Bulb.		
Morn.	Noon.	A'noon.	Morn. F.	Noon. F.	A'noon. F.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. mm.	Noon. mm.	A'noon. mm.	Morn. F.	Noon. F.	A'noon. F.	Morn. F.	Noon. F.	A'noon. F.
96	96	76	99.9°	99.9°	99.4°	160	124	142	100	90	120	66.2°	61.2°	71.2°	56.4°	56.8°	61.2°
92	96	100	99.9°	99.9°	99.8°	126	100	80	60	60	50	62.8°	68.2°	64.6°	56.8°	61.0°	62.0°
100	88	96	99.8°	99.2°	99.3°	109	108	116	48	70	80	71.8°	70.0°	72.0°	60.6°	63.0°	62.4°
80	92	88	100.1°	99.0°	98.4°	129	164	158	94	120	120	71.4°	66.0°	68.4°	68.0°	59.2°	62.6°
80	60	114	100.5°	99.6°	100.5°	102	90	98	86	40	64	79.0°	64.4°	66.6°	68.5°	60.3°	62.8°
100	96	96	100.5°	100.3°	99.9°	150	134	142	110	100	100	72.7°	66.2°	68.2°	67.6°	59.2°	62.4°
72	84	72	99.9°	98.6°	99.2°	110	140	106	47	108	60	72.1°	73.8°	70.4°	67.8°	71.2°	65.3°
100	76	100	99.3°	99.5°	100.5°	104	124	124	60	100	90	71.8°	71.4°	68.2°	62.2°	63.3°	59.8°
92	96	104	100.5°	100.5°	100.6°	104	112	118	70	80	80	74.3°	66.8°	66.4°	63.5°	59.9°	58.6°
88	88	84	99.9°	98.6°	99.0°	132	100	90	80	50	54	70.0°	71.4°	69.4°	60.6°	62.8°	63.9°
92	92	112	99.9°	100.6°	100.2°	122	118	124	100	98	80	55.6°	50.2°	59.2°	50.0°	50.0°	55.6°
100	108	88	99.3°	100.5°	99.1°	106	120	140	65	60	98	64.4°	61.2°	57.2°	57.9°	60.3°	53.8°
60	66	64	99.0°	100.6°	100.1°	110	110	97	75	85	70	67.6°	67.8°	62.0°	69.3°	64.8°	59.4°
82	88	88	100.3°	99.2°	100.2°	130	120	104	85	90	72	53.8°	70.2°	68.6°	52.0°	65.5°	61.0°
72	68	68	100.1°	100.2°	100.4°	132	142	107	100	104	40	70.7°	63.0°	68.2°	60.8°	58.6°	65.8°
76	84	96	99.1°	99.0°	99.1°	100	82	120	64	58	88	55.6°	62.8°	64.8°	53.2°	61.2°	60.1°
96	100	92	100.2°	100.5°	99.4°	168	144	138	130	110	108	62.1°	59.4°	70.5°	59.0°	57.9°	66.4°
102	80	72	99.9°	100.2°	99.4°	130	132	103	106	100	70	66.4°	68.5°	72.9°	58.4°	66.0°	68.2°
102	104	104	99.9°	99.8°	99.3°	94	93	100	44	65	70	66.4°	66.4°	74.9°	58.4°	61.0°	73.4°
Av. 88	87	90	99.9°	99.8°	99.7°	122	119	117	80	84	79	66.0°	65.8°	67.6°	60.6°	61.2°	62.4°

Average Air Temperature.

	Dry Bulb. F.
Morning	33.3°
Noon	29.0°
Afternoon	29.6°

Average Katathermometer Readings.

	Dry Bulb. 110°-100° F.	Wet Bulb. 110°-100° F.	Wet Bulb. 100°-90° F.
Morning	67 seconds	32 seconds	40 seconds
Noon	59 seconds	33 seconds	38 seconds
Afternoon	51 seconds	35 seconds	38 seconds

the degree of fall did not seem dependent on the degree of heat; during the rest of the day the blood pressure remained at about the same level. The diastolic blood pressure in general followed the same course as the systolic blood pressure.

It is of interest to point out that rectal temperature and blood pressure of the men working at a temperature slightly below freezing point did not vary considerably from those of men working at a wet bulb of between 22.2° and 23.8° C..

Summary.

An inquiry into certain of the physiological functions of wharf labourers in Townsville proved that there is a general tendency for the rectal temperature to rise and remain at a higher level with higher wet bulb readings; it is, however, noteworthy that even when the wet bulb temperature reached 30° C., the averages for rectal temperatures were only betwen 37.7° and 38.3° C., with a maximum of 38.8° and a minimum of 37.5° C.. The heat regulating mechanism of the labourer was not severely affected and he was still able to maintain a temperature equilibrium, although at a somewhat higher level.

The average pulse rate did not show constant variations, perhaps it was slightly higher on hot days.

The skin shirt temperature did not vary greatly, but was much lower in the men working in the freezing room.

The average systolic blood pressure did not present constant changes, although it showed a tendency to fall with the progress of the day, concomitant with profuse sweating. The diastolic blood pressure followed closely the course of the systolic pressure.

Conclusions.

These observations carried out on a large scale prove that under conditions such as prevail on the wharf in Townsville the heat does not affect in a constant manner the men working either in the hold of ships or on the wharf in the sun as far as pulse rate and blood pressure is concerned, but only causes a slight rise in rectal temperature and perhaps in pulse rate, which roughly varies with the level of the wet bulb reading.

References.

Griffith Taylor (1918): "The Australian Environment," Advisory Council of Science and Industry, Memoir 1, Melbourne.

Haldane (1905): *Journal of Hygiene*, Vol. V., p. 494.

Young, Breinl, Harris and Osborne (1919): *Proceedings of the Royal Society*, B., Vol. 91, p. 111.

Reports of Cases.

NOTES ON A CASE OF LANE'S ILEAL KINK.

By **H. Thorburn Illingworth, M.B., Ch.M.,**
Resident Surgeon, Toowoomba Hospital, Queensland.

The patient, G.C., *æt.* 58, married, was admitted to this Hospital on February 16, 1921, and discharged on March 12, 1921.

History of Condition.—The patient on admission complained of pains which had come on suddenly the previous day, situated principally in the left iliac region. The pains seemed to shoot round in a kind of girdle at the level of the anterior superior iliac spines.

Pains were intermittent, but for 12 hours had been very severe and within the last two hours had settled down over McBurney's point.

There was no vomiting, but an inclination to vomit and some looseness of the bowels on the previous day.

There was no cough. The urinary and nervous systems appeared to have been unaffected except for the occurrence of recurrent headache in both frontal regions of a dull and "deep-in" character.

Condition on Admission.—Patient was a poorly nourished, pale man. He had an anxious expression and was apparently in a good deal of pain. His hands and body were clammy with sweat and his pulse was regular, rate 72, weak, tension poor and force poor.

His respirations were shallow, 24 per minute. The temperature was 37.2° C..

The general condition was one of shock and collapse.

There was generalized board-like rigidity of the abdomen, with pain and tenderness all over the abdomen, particularly on pressure over McBurney's point and round the umbilicus.

No abnormal condition was detected on rectal examination.

The urine was clear. The urinary system was clear, as were the other systems.

Diagnosis.—A diagnosis of acute appendicitis was made and three hours later the patient was subjected to operation.

Previous History.—Patient has been a farmer all his life, but in the last few months has had a good deal of heavy work, such as stacking, lifting, etc.. He used to feel tired and had some pains in the lower iliac and hypogastric regions for about three months.

He had one previous attack two months before in the form of pains in the iliac regions, below the ribs and in the pit of the stomach, without vomiting, but with some diarrhœa, which passed off after two days spent in bed.

Operation.—A McBurney's incision was made and the usual grid-iron method used to open the abdomen. The cæcum was normally placed and was brought into the wound without difficulty.

The appendix was found in its normal position. It was absolutely normal except for being small and narrow. It was removed and the incision closed.

Another incision was made in the middle line below the umbilicus and the small bowel was carefully examined and explored.

The whole of the iliac portion of the small bowel was very congested, the upper part being collapsed; the lower 25 cm. were acutely distended and about 3.5 to 5 cm. from the ileo-cæcal junction a firm constricting band was found.

This band was attached above to the posterior abdominal wall and seemed to form a thickened fold of mesentery attaching to the right iliac fossa. Below it was slightly larger and extended down to the brim of the pelvis, where collapsed but somewhat congested ileum was to be found.

The band was carefully tied and removed and the affected portion of ileum covered with peritoneum.

The wound was closed and the patient returned to the ward with an irregular pulse, in a very weak condition and looking very collapsed and cyanotic.

Subsequent History.—During the week there was intermittent slight fever, with the passage of a good deal of flatus. Some difficulty was experienced in getting the patient's bowels well opened. The patient then made an uninterrupted recovery, went home at the end of the third week and has had no trouble since.

In conclusion I would venture to suggest that this condition corresponds to what has been described as Lane's ileal kink. Whether such a condition was influenced by the man's occupation, whether such a condition is often found and other points in connexion with the matter, I leave to your readers to decide, but would be pleased to hear details of any corresponding cases.

TWO CASES OF EXTRA-GENITAL CHANCRE.

By **Norman Paul, M.B., Ch.M.,**
Honorary Dermatologist, Royal Alexandria Hospital for Children; Honorary Assistant Dermatologist, Sydney Hospital.

Acquired Syphilis in a Child.

The following case of a girl, *æt.* 2¼ years, who contracted syphilis from an infant brother with congenital syphilis, is of interest. Seven months ago the mother brought the boy, then about 8 weeks old, to me with signs of congenital

syphilis, but she discontinued the treatment on the disappearance of the local lesions.

She returned recently with the same infant with signs of recurrent cutaneous lesions, with marked fissuring of the lips, with a depressed bridge of the nose and with the appearance of a congenital idiot. Along with this unfortunate child she had a bright little girl of 2½ years, whom she casually asked me to examine. This examination disclosed on the lower lip a little to the right of the mid-line an indurated looking sore, with a slightly depressed centre about the size of a threepenny piece, together with an enlarged submaxillary gland on the right side.

Diagnosis of chancre was made. On microscopic examination spirochætes were demonstrated. This chancre was doubtless contracted by the child while kissing its infant brother, a congenital syphilitic, with marked fissuring of the lips.

Chancre of the Thumb in a Nurse.

That the danger to which nurses are subjected of becoming infected with syphilis is a real one is demonstrated by the following case of a midwifery nurse who contracted the disease from a woman during childbirth. The case calls for comment as regards the instruction or lack of instruction given to nurses in this subject. The sore had been

treated as a septic one. As it did not heal with ordinary remedies the patient consulted me, when the nature of the lesion was evident. No cutaneous eruption was present, but spirochætes were obtained from the sore and the examination of the blood gave a positive Wassermann reaction. The lesion, as is usual in extragenital chancre, is of a large size and its nature is well demonstrated by the accompanying photograph.

Reviews.

SOME ASPECTS OF PAPUA.

Captain C. E. W. Monckton does not profess to be a stylist. There is no cacophony, no journalistic solecism, that he cannot achieve and his prattle, gay and artless, reminds us of the divine babble of Mr. Pepys. Yet his "Reminiscences of a New Guinea Resident Magistrate"[1] are worked into an extraordinarily interesting book, one of those books which keep us out of bed till two in the morning. It is the autobiography of Captain Monckton during the twenty years or so before the war, containing a series of vivid thumbnail portraits, hair-raising adventures and much of the inner history of Papua during the heroic time when Macgregor was moulding it into its present form. Monckton knows his natives, his beach-combers, his brother officials and his New Guinea; he has the art of making them all stand before us in stereoscopic brilliance.

Sir William Macgregor was one of that little band of Scotch doctors—like Sir Normand MacLaurin and Sir Thomas Anderson Stuart, all intimate friends in the brave days when Plancus was Consul—who, having graved their names deeply on Australasian history, are already assuming the aspect almost of half-legendary heroes. Like everyone else who came under the influence of Sir William, Monckton was captivated by his enormous personality; the sections devoted to that hero are not the least interesting parts of his book. He refers generously to many of the great-hearted gentlemen who helped Macgregor, to Moreton, Armit, Kowold and many more, most of whom sleep under the palms, victims of malaria. Till recently Papua was a white man's grave and it is largely owing to Macgregor that it is now comparatively safe and healthy. Captain Monckton disclaims all effort at scientific achievement, yet one gets a truer idea of Papua from him than from many a duller writer. Much of his story consists of sheer adventure, battles with natives, great sharks, gropers, alligators and the like, which read more like romance than reality. But every now and then some intimate detail occurs which could have been written only by a man who had actually experienced what he described. We quote an adventure of one German Harry, who declared war on a big Dane for wallopping his own wife, surely an innocent enough pastime in Papua. If a man may not even wallop his own wife, who in the name of Fortune may be wallop? Harry began by calling the Dane "*Schweinhund.*" Hear Captain Monckton: "A glass of rum promptly smashed on Harry's teeth, followed by a bellow of rage and the thrower's rush. Harry in a single instant became a lunatic and flying at the other's face, kicking, biting and clawing, bore the big man to the ground from where in a few seconds agonized yells of 'he is eating me' told us that the Dane was in dire trouble. Harry was dragged away by main force and we found half his victim's nose bitten off, while a bloodshot and bleeding eye showed how nearly his thumb had got its work in. The wife-beater went off a mass of funk and misery. 'You are a nice cheerful sort of little hyæna,' I remarked. 'What sort of fighting do you call that?' 'That? O, that was nothing. I only wanted to frighten him or I would have had his eye out as well. He won't throw a glass at German Harry again.'" Harry seems to have been a forthright sort of scoundrel, "a tall man of his hands" as Alan Breck might have said. No woman ever need lack a husband while he was about and he ended appropriately as the chief of a matrimonial bureau in Sydney. All the book is not occupied with beach-combers and pirates; but Captain Monckton has a Homeric power of turning his characters into heroes. The epic fellows flash upon the screen and, after too brief a glimpse, are gone, leaving us wishful to hear more of them. But in real life we never do hear the end of a story. It is because Captain Monckton is himself so intensely alive that his book is so vivid. With due acknowledgements to Stevenson, an even greater writer of romance, we might say that not Kingston, nor Ballantyne the brave, nor Cooper of the wood and wave ever wrote anything half so enthralling.

[1] Some Experiences of a New Guinea Resident Magistrate, by Captain C. A. W. Monckton, F.R.G.S., F.Z.S., F.R.A.I., some time Official Member of Executive and Legislative Council, Resident Magistrate and Warden for Goldfields, High Sheriff and High Bailiff and Senior Officer of Armed Constabulary for H.M.'s Possession of New Guinea; 1920. London: John Lane. New York: John Lane Company. Sydney: Angus & Robertson, Limited; Demy 8vo., pp. 337, with 37 illustrations and a map. Price, £1 1s. net.

THE TREATMENT OF DIABETES.

The physician who treats a patient suffering from *diabetes mellitus* is no longer the mysterious thaumaturge who works in clouds of incense swung from the thurible of a secret art. Instead he has laid all his secrets before the discerning eyes of the multitude who have not been slow to take advantage of the privilege. The diabetic, it might almost be said, has been promoted consultant to his own physician.

Dr. Philip Horowitz calls his book "Diabetes: A Handbook for Physicians and Their Patients."[1] Perhaps more accurately it should be called "The Treatment of Diabetes," as the book is concerned with dietetics and therapeutics in fully nine-tenths of its volume. Only a few pages are devoted to the ætiology of the disease and these will be considered highly debatable by most readers. The author writes that not only diabetes but other expressions of metabolic disturbance, including nephritis, arterio-sclerosis and gout are "the result of an auto-intoxication, causing an interference with the function of the ductless glands or irritation of these and other organs." The few pages which are concerned in the elaboration of this doctrine may impress the patients for whom the book is intended, if they have the necessary knowledge to understand them; the physician will remain mildly unimpressed if not vigorously aggressive.

The author repeatedly confuses "patient" with "case." We are informed that the "case should be put to bed at once" (p. 76), that certain "patients are mild cases that have been neglected" (p. 65), that "many cases cannot tolerate grape fruit." When we have said this and that to see and understand 21 of the 27 figures the reader will require the aid of a magnifying glass, we have said all in derogation of the book. The dietetic treatment of patients suffering from mild, moderately severe and severe forms of diabetes is discussed in lucid, practical fashion. The menus, recipes and tables are a storehouse of valuable information which will be appreciated more in America than in Australia, where many of the hard breads, breakfast foods, chocolates, etc., mentioned are not manufactured.

The tests for the presence of sugar, acetone and diacetic acid in the urine are described at the end of the book.

TRANSMISSION OF PATHOLOGICAL SPECIMENS BY POST.

The Council of the Victorian Branch of the British Medical Association desires to direct the special attention of its members to the subjoined letter from the Commission of Public Health.

> In pursuance of a resolution of the Commission of Public Health, I beg to draw the attention of the Victorian Branch of the British Medical Association to the fact that it has been officially reported that the attached Regulation of the Postal Department (Reg. 46) governing the transmission through the post of bacteriological or pathological specimens has been frequently violated of late and I am accordingly to ask that you may be so good as to bring the matter before the members of the Association as far as possible.

With regard to the clause letter (*d*) of Reg. 46, the Acting Deputy Postmaster-General intimates (under date February 8, 1921):

> As the provisions of the above section of Regulation 46 are intended to apply to throat swabs only, it is considered that an endorsement to the effect that the packet contains throat swabs obtained too late to permit of the packet being handed in at a post office for registration should appear on each packet so posted. Bacteriological specimens not endorsed "throat swabs" posted as ordinary packets will in future be treated as having been posted contrary to the provisions of Regulation 46.

The Superintendent of Mails of the Postmaster-General's Department states that the Regulation 46 is disregarded in two ways:

(1) Failure on the part of senders of packages to register the package.

(2) In cases where it is too late to register packets containing throat swabs, failure to write an endorsement to that effect on the packet.

Numerous instances of non-compliance with regulations have occurred of late and it is the intention of the authorities to proceed against medical men who forward pathological specimens through the post in contravention of the regulations.

It is desired to emphasize that Regulation 46 (2) (*d*) applies to "throat swabs" only and is intended to facilitate the quick diagnosis of threatened epidemics for the public safety. It was never intended that the facilities under this section of the Regulation should be availed of except in extreme cases and when it is used the endorsement is essential for the safe delivery of the specimen. If the endorsement is omitted, the parcel will not be delivered to the addressee. At least 20 such packets are lying in the dead letter office through the failure to endorse them and this will be the fate of all such non-endorsed parcels. In addition, the penalty may and will be enforced.

Postmasters in the country and suburbs have been instructed to warn medical men against breaches of Regulation 46.

It may be pointed out to members practising in the suburbs that depôts exist in the city, where specimens may be left for transmission to the University Laboratory. These depôts are H. Francis & Co., chemist, 111 Collins Street, and the Town Hall, Swanston Street, Melbourne. Packets may be left properly addressed, up till 3 p.m. each day except Saturday and Sunday. Some members who are too busy to convey specimens to the laboratory, make use of the patient's relatives or friends for purposes of transport.

The Regulation 46, contained in the Post and Telegraph Guide, is set out in full in *The Medical Journal of Australia* of October 16, 1920, page 389, and the additional clause 2 (*d*) in the issue of November 27, 1920, page 506.

Naval and Military.

APPOINTMENTS.

The following promotions, etc., have been notified in the *Commonwealth of Australia Gazette*, No. 31, of April 7, 1921:

Second Military District.

Reserve of Officers—

Captain G. B. Packham to be transferred to the Reserve of Officers, 6th Military District, 28th February, 1921.

Major E. K. Parry, M.C., to be appointed to the Australian Army Medical Corps and to be Captain, 15th February, 1921.

Captain S. McLennan to be granted the temporary rank and pay of Major whilst employed at No. 4 Australian General Hospital, 1st January, 1921.

Third Military District.

Australian Army Medical Corps—

Captain (provisionally) G. W. Smithwick to be transferred to the Reserve of Officers and to be Honorary Captain, 1st March, 1921.

Captain (Honorary Major) B. T. Zwar to be transferred to the Reserve of Officers and to be Major, 1st March, 1921.

Reserve of Officers—

The temporary rank of Lieutenant-Colonel granted to Honorary Major R. H. Russell is terminated, 21st September, 1920.

Honorary Major R. H. Russell to be placed on the Retired List, with permission to retain his rank and wear the prescribed uniform, 15th February, 1921.

Sixth Military District.

Reserve of Officers—

Captain G. B. Packham to be transferred from the Reserve of Officers, 2nd Military District, 28th February, 1921.

We learn that Dr. E. W. Chenoweth has been appointed Stewart Lecturer in Medicine, in succession to Sir Henry Maudsley, K.C.M.G., C.B.E..

[1] Diabetes: A Handbook for Physicians and Their Patients, by Philip Horowitz, M.D.; 1920. New York: Paul B. Hoeber; Crown 8vo., pp. 196, with 27 text illustrations and two coloured plates. Price, $2.00.

The Medical Journal of Australia.

SATURDAY, APRIL 16, 1921.

The White Man in the North.

A few months ago the question of the possibility of developing tropical Australia with the unaided instrument of the labour of the white man was debated at Brisbane. The views expressed in that admirable discussion were based partly on scientific investigation and observation, partly on clinical experience and partly on political sentiment, if we may be excused for using so paradoxical a phrase. The final answer to the question was not given. It may be long delayed; it may never emerge from its shroud. Yet every true Australian knows that unless an affirmative reply is given within a relatively short time, this vast, wealthy, inexhaustible land will neither be safe for those who have struck the first cord of a wonderful national melody, for those whose blood and sweat has been given in the pioneer stage of the making of a great nation, nor retain the characters which have compelled him to hold it dearer than any other. White Australia is at once a sentiment and a necessity for all of us. Some of the speakers had little faith and falteringly allowed their fearfulness to dominate their aspirations. They were not prepared to believe that the home environment could be improved to such an extent that the white woman could escape the enervating effects of domestic work carried out under the blaze of the tropical sun. Expressions of opinion, the recording of impressions and arguments based on observations in individual cases do not help to a solution of the problem. History has failed up to the present to give any indication whether or not the labour essential for the full exploitation of the inherent riches of the tropical parts of Australia can be performed by men and woman of European descent. This is eminently a physiological problem. The political aspect of the question, whether or not the industries of the north can be developed economically with white labour and whether or not the wages that the captains of industry can offer, will tempt the white man to leave the more temperate regions, cannot be settled in advance. Time and direct experiment alone can yield an unequivocal reply. In other words, we should be able to predict whether the white man and woman can live and work in the north without suffering in health. Whether they will do so in numbers sufficient to admit of the development of the tropical areas is quite another story. How strangely complex the matter is, is revealed by the daring application of the phrase "sentimental humbug" by the learned Lieutenant-Governor of Victoria. There is a physiological value in sentiment. No economic, no utilitarian motives will weigh with a mother who is asked to live in an environment in which her baby cannot thrive. Can anyone maintain that the sentiment that impels the mother to demand favourable conditions for her baby, or that induces the wife to tolerate hardship in order to perform her marital and maternal duties is humbug? Without sentiment of this kind, the future of Australia would be dark indeed.

It must be recognized that the physiological problems associated with the white Australia question are many sided. At the last meeting of the Australasian Medical Congress only a few of the problems were attacked. From the workers at the Institute of Tropical Medicine we received reports of the only investigations that have been conducted on the subject. We publish in this issue a detailed analysis of the physiological responses of white men working in Townsville. The investigation necessitated an enormous amount of arduous work. Dr. A. Breinl and his erstwhile colleagues are to be congratulated on the thoroughness of their methods, on the care and patience exhibited and on the earnestness of the attempt to provide data for the elucidation of this difficult problem. We have gladly placed a considerable amount of our limited space at his disposal. Our readers will now be able to satisfy themselves from the mass of data compressed in the seven pages of tables and from the ingenious graph that the deductions of Dr. Breinl are justified. We propose at a later date to publish another paper by him dealing with the evidence on which Dr. Breinl has arrived at the conclusion that north Queensland is not essentially less healthy than other parts of the State or of the Commonwealth. Contained in these two articles is all the physiological information available at present. Notwithstanding

the large amount of work entailed and the immense amount of energy displayed, this information is insufficient for our purpose. It justifies us, however, in the contention that no facts have yet been adduced which might render unacceptable the view that the white man and woman can work and remain healthy in the tropical parts of Australia.

THE CARDIOVASCULAR REACTION TO EPINEPHRIN.

The suprarenal glands of all vertebrate animals are known to secrete into the blood a substance which exerts a powerful influence on the organism. The active principle of this substance was first isolated by Abel and to it was given the name epinephrin or adrenalin. The investigations into the action of this drug form one of the most fascinating chapters in the history of pharmacology. Cannon was the first to show satisfactorily that during intense pain or under the stress of certain violent emotions a marked increase of secretion of adrenalin takes place in the body, probably under the influence of the sympathetic nervous system. This was a reasonable explanation of the "sympathetic" phenomena observable when an animal is stricken with pain or fear—the dilated pupil, vaso-constriction, racing heart and increase of blood pressure. Prior to Cannon's investigations several observers had reported the discovery of an increase of epinephrin in the blood of patients suffering from certain diseases, notably exophthalmic goître. They used the serum of venous blood in their experiments and though unable to isolate a substance chemically indistinguishable from epinephrin, they concluded that it was present by its physiological action when applied to certain preparations containing smooth muscle, *e.g.*, the eye of a frog and the uterus of a rabbit. As contraction of smooth muscle, the usual response to epinephrin, resulted when the serum was applied, this fact was considered *prima facie* evidence of the presence of epinephrin in the blood. Clinicians welcomed these findings, since they allowed a more or less adequate explanation of certain clinical features of Graves's diseases, *e.g.*, the tachycardia, the dilated pupils and the ocular signs of von Graefe, Moebius and Stellwag. That indirect methods of scientific investigation are frequently associated with fallacious deductions was soon made evident. J. M. O'Connor in the year 1912 threw a bombshell of criticism into the midst of these beliefs. He showed that if instead of serum citrated plasma were used in the experiments, no influence on plain muscle was manifest. He further showed that during the process of coagulation certain substances are formed in the blood which by direct action on smooth muscle cause its contraction. It was these substances which were mistaken by other observers for epinephrin.

In more recent years attempts to elucidate the action of the drug in health and disease have been made by another method. Epinephrin has been injected either subcutaneously or intravenously into certain individuals and the pharmacological reactions have been studied. Among the students of the action of epinephrin when administered according to this method is Dr. Paul W. Clough, who has investigated the cardio-vascular reaction of the drug.[1] As subjects for his experiments he chose a number of individuals regarded as physically normal as well as a limited number of patients, some of whom were suffering from arterial hypertension. A subcutaneous injection of 0.5 to 1.0 c.cm. of a 1 in 1,000 solution of adrenalin was given. The reactions were found to be divisible into four groups. The first were "negative" or insignificant reactions. There were no subjective symptoms and the rise in the systolic blood pressure did not exceed 15 mm. of mercury. About 40% of all individuals tested gave this mild response and of the 32 normal persons only 30% reacted in this manner. The second group represented reactions of moderate intensity. It was noticed that the systolic blood pressure rose 15 to 30 mm. above the figure registered prior to the experiment and that there was a corresponding fall in diastolic pressure of 10 to 20 mm.. The pulse pressure, therefore, rose considerably and was in certain instances doubled. A slight degree of tachycardia was noticed, but the subjective symptoms were mild. Sixteen of the 32 normal persons manifested this reaction which occurred in 24% of all persons tested.

The third and fourth groups were classed as "marked" and "very marked" reactions respectively. The former occurred in 4 of 32 normal persons and in 23% of all persons tested. The systolic pressure rose by as much as 50 mm., while the diastolic pressure sometimes fell and sometimes rose slightly. Frequently the skin and mucous membranes grew pale. The patient became alarmed, complained of palpitation, fluttering in the chest and throbbing in the head. Transitory glycosuria was not uncommon. In very marked reactions the rise in systolic pressure was enormous. In one instance it leapt from 110 to 205 mm. of mercury. The pulse pressure invariably rose, in some instances by as much as 200%. The patient trembled and shivered and suffered from a feeling of intense discomfort and anxiety. Precordial pain simulating *angina pectoris* was not uncommon and in some instances the patient stoutly refused a repetition of the experiment, so alarmingly did he view these subjective phenomena. These exaggerated responses to epinephrin occurred in two individuals regarded as physically fit and well and in 13% of all subjects of the experiments.

Dr. Clough draws certain conclusions from his observations. He believes that epinephrin acts not only by virtue of its power of vaso-constriction, but also (and this he considers the more important action) by direct stimulation of the heart, increasing its rate, augmenting the force of its beat and increasing its quantitative output. The conclusion seems a rational one. Were the action one of vaso-constriction alone the fall in diastolic pressure would be inexplicable. If, as we believe, the diastolic pressure is an expression of the vaso-motor tone of the radial artery, we are forced to go one point further than Dr. Clough and, assuming that his observations are correct, to argue that there must temporarily be a re-

[1] *Johns Hopkins Hospital Bulletin*, August, 1920.

laxation of the radial artery and not a vaso-constriction. The palpitation, the anginoid distress and the visible heaving of the pericardium support the view that the myocardium is powerfully stimulated to contraction. That vaso-constriction does in certain instances come into play is shown by the occasional rise in diastolic pressure and the pallor of skin and mucous membranes.

A second point of importance resulting from Dr. Clough's investigations is that patients with hypertension frequently show violent reactions to epinephrin. He obtained marked responses from 15 of 22 patients with hypertension. The observations are too few to allow of any general deduction. Other observers have noticed similar reactions in patients whose blood pressure was persistently low. The tests should be made on large numbers of patients suffering from other diseases before any conclusions are admissible. Dr. Clough is a careful observer who tempers his work with calm judgement. His clear, well-written paper is well worthy of perusal.

CONGENITAL HEART BLOCK.

Although partial or complete atrio-ventricular dissociation occurs not uncommonly in the hearts of adults, it is a phenomenon of extreme rarity in the case of children. If we exclude those instances of heart block associated with acquired cardiac disease in children, there remain only seven recorded cases of partial or complete dissociation which may reasonably be described as congenital. Drs. E. P. Carter and J. Howland,[1] while publishing the details of an eighth example which has come within their own experience, review the histories of the other seven. They exclude five other cases occurring in the literature on the ground of insufficient proof of the correctness of the diagnosis. One of these was reported in the *Australasian Medical Gazette* by Dr. Macdonald Gill in 1911. Dr. Gill was unable to obtain a tracing of the jugular venous pulse which, when compared with the radial tracing obtained, would have put the question of dissociation beyond doubt. It is necessary to have polygraphic or electrocardiographic tracings in the first place to prove the existence of conduction-block in the bundle of His. In the second place it is necessary to have a reasonable certainty of the congenital origin of the disease. This is possible if the three great causes of cardiac mischief in early childhood can be excluded, namely, rheumatic fever, scarlet fever and diphtheria, if the clinical evidence points to the presence of a congenital lesion and if the disease process is found to exist at an early age. The case described by Drs. Carter and Howland fulfilled these three requirements. The patient was a girl of five years, in whom at the early age of nine months the family physician discovered a cardiac murmur, systolic in time and rough in quality. At the age of four she had a slight syncopal attack and it was then discovered that her pulse averaged only 46 beats to the minute, whereas the veins of her neck were pulsating twice or thrice as fast. The patient was seen by the authors at the age of five years. She suffered from no untoward symptoms; there was no distress on exertion, no cyanosis, no clubbing of the fingers. The cardiac dulness was slightly enlarged to the left. A harsh systolic murmur, loudest at the apex and not transmitted towards the axilla, was heard. Electrocardiographic records proved the existence of a complete atrio-ventricular dissociation. One tracing showed a ventricular rate of 37 and an auricular rate of 103 to the minute. The extraordinary feature was the ability of the girl to indulge in strenuous amusements without distress. Only rarely was she glad to rest and not to move on what she called her "tired day." Another remarkable clinical fact was the absence of pronounced syncopal attacks. Indeed, the general absence of syncope in all but one of the recorded cases would seem to show that the heart had learnt during the periods of comparative inactivity preceding and following the child's entry into the world to adapt itself gradually to the circulatory requirements of the body.

It is incredible that the twelve cases, substantiated or unsubstantiated, of congenital heart block recorded in the literature represents even a moderate proportion of the cases which have come under the notice of physicians. Perhaps the belief that the literature of the subject is larger than it actually is, makes the physician less keen in the recognition of heart block in children. A more general use of the polygraph might help us to elucidate the incidence of this very interesting morbid condition.

[1] *Johns Hopkins Hospital Bulletin*, October, 1920.

THE PUBLIC HEALTH ASSOCIATION OF AUSTRALASIA.

The Executive Council of the Public Health Association of Australasia announces that inaugural meetings will be held in the six States of Australia during the months of April and May. In Melbourne a meeting will be held at the Town Hall on April 11, 1921, at 8 p.m.. His Excellency the Earl of Stradbroke will preside and Her Excellency the Countess of Stradbroke will accompany him. The meeting will be addressed by Mr. Frank Tate, Dr. J. H. L. Cumpston and others. On the same date a meeting will be held in Hobart in the evening.

The date fixed for the meeting in Perth is April 12, 1921, and the hour 8 p.m.. In Brisbane there will be a meeting on April 20, also at 8 p.m.. The date of the meeting in Adelaide is not yet announced, but we understand that it is the intention of those responsible to hold it late in April. The meeting in Sydney will take place in the first week in May at the Town Hall.

His Excellency the Governor-General has signified his approval of the Association and will be its Patron.

The arrangements for the meetings in the various capital cities are in the hands of the local members of the Executive Council. As far as is practicable, uniformity has been introduced in these arrangements. Invitations are being issued to persons specially interested in hygiene and preventive medicine and the presidents and secretaries of the chief health and kindred societies. Special invitations are being issued to the Councils of the Branches of the British Medical Association in the several States. The organizing committees hope that large numbers of medical practitioners will attend the meetings.

It is with much regret that we have to record the death of Dr. Henry Michael O'Hara, which occurred on April 7, 1921, at Portsea, Victoria.

Abstracts from Current Medical Literature.

THERAPEUTICS.

(139) Mercury in Tuberculosis.

Having regard to the fact that clinicians have for many years reported that mercury in various forms exercised a beneficial influence in human pulmonary tuberculosis, L. M. de Witt has endeavoured to ascertain the therapeutic action of a large number of mercurial compounds in tuberculosis of guinea pigs (*Journ. Infect. Diseases*, February, 1921). The points investigated were the degree of toxicity for animal tissues of the several preparations, the relative disinfectant power, the stability and the solubility in non-toxic and non-irritant solvents of the compounds. The preparations used included the chlorides, the sulpho-cyanide, allyl alcohol mercuric acetate, several organic compounds of mercury and iodine, methylene blue and methylene green combined with mercuric chloride and some diazo-amino mercuric compounds. It was found that all the mercury compounds, whether soluble in water, soluble in dilute alkali or insoluble, exerted inhibition on the growth of tubercle bacilli. While the majority inhibited the growth in a dilution of 1:10,000, three were active in a dilution of 1:20,000. These were allyl alcohol mercuric acetate, methylene-blue-mercuric chloride and 1-amino-2 (para-naphthalin-azophenyl mercuric acetate)-5 sulphonic acid. The results of the therapeutic experiments revealed that the length of the life of the infected guinea-pigs after treatment was much greater when methylene-blue and mercuric chloride were used than without treatment and the extent of the disease after death was much less. In the animals treated with mercuric sulpho-cyanide, mercuric succinimide, 1-amino-2 (p-naphthalin amino phenyl mercuric acetate)-5 sulphonic acid and diazo-amino-methylene-blue orthophenol mercuric chloride the life was prolonged to some extent and the lesions were less extensive than in the control animals. Slighter action was detected after treatment with mercurol (mercury and nucleinic acid) and with a few other preparations. Moreover, the author points out that the beneficial results in guinea-pigs probably corresponded to much better effects in human beings, since guinea pigs are highly susceptible to the disease and succumb readily to it.

(140) Vagotonia Reaction in Asthma.

H. L. Alexander and R. Paddock have endeavoured to ascertain the nature of the various contributory or associated conditions of bronchial asthma, by studying the results of physical examination during the intervals between the attacks (*Archives Int. Medicine*, February, 1921). The most constant and definite factor determined was the increased sensitiveness to pilocarpine. It was found that patients subject to attacks of bronchial asthma reacted by the onset of asthmatic breathing, salivation, sweating, epiphora, flushing and a feeling of warmth to 0.003 grm. doses of pilocarpine, which produced little or no effect in normal people. The authors satisfied themselves that the patients who responded most energetically to pilocarpine, were those with constitutional defects, such as the *status lymphaticus*. This term is used to indicate the condition of persons with transverse pubic hair lines, absence of thoracic and abdominal hair, scanty axillary hair, arched thighs and broad pelvis. Many of these patients also responded more readily than usual to adrenalin. In this reaction there was an abnormal rise in the blood pressure. It was further noted that the majority of the patients who gave an excessive reaction to adrenalin, were found to have a low blood pressure before the injection. It is held that the increased sensitiveness to the two drugs indicate the condition spoken of as vagotonia. These patients should not be given large doses of adrenalin for therapeutic purposes. It is usually sufficient to administer 0.25 c.cm., a smaller dose than is usually employed.

(141) Preservation of Benzyl Alcohol.

D. I. Macht and A. T. Shohl have made some experiments on the stability of solutions of benzyl alcohol (*Journ. of Pharm. and Exper. Therapeutics*, August, 1920). They state that, next to efficiency in producing anæsthesia and to safe limits of toxicity, the two qualities which are necessary for the clinical use of a local anæsthetic are ease in sterilization and satisfactory keeping in solution. It has already been shown that benzyl alcohol is an efficient anæsthetic and that it is by far the least toxic of all the common local anæsthetics in daily use. Solutions of benzyl alcohol in water can be kept indefinitely in a sterile condition, since the high boiling point (204.7° C.) permits of sterilization by boiling and since even weak solutions are germicidal. The authors record some further experiments on the stability of aqueous solutions. They enclosed solutions of different specimens of benzyl alcohol in sealed ampoules made from various kinds of glass. At intervals of time these solutions were examined in respect to anæsthetic efficiency and to hydrogen ion concentration. The ampoules were kept from a few days to over 2 years. The anæsthesia was tested upon the cornea of the rabbit's eye and on the dog's eye. Observations were made on the rate of onset of anæsthesia, on its duration and on the extent of irritation. The hydrogen ion concentration was determined colourimetrically by the indictors suggested by Clark and Lubs. The authors found that some of their solutions had lost a great part of their ability to produce anæsthesia. These solutions had been stored in soft glass from which alkaline substances dissolved in the solutions. Under these circumstances there was rapid deterioration in anæsthetic strength. When the solutions had been kept in containers of non-soluble glass they retained their anæsthetic efficiency and became slightly more acid in reaction. This observation supplies a simple test for the testing of glass for making sealed ampoules. Many samples of benzyl alcohol contain benzaldehyde. This undergoes oxidation and may increase the acidity of solutions to such an extent that irritation may be produced. Samples of benzyl alcohol can be freed from benzaldehyde by shaking them with solutions of sodium sulphite and subsequently with water. The authors recommend the addition of buffer substances to solutions to be preserved for some months.

(142) The Effects of Petroleum Vapour.

H. W. Haggard has examined the anæsthetic and convulsant effects produced by the inhalation of gasoline vapour on dogs (*Journ. Pharm. and Exper. Therapeutics*, December, 1920). The symptoms and effects of the inhalation of gasoline vapour by men have been noted in the petroleum industry. From time to time, accidental deaths have occurred among men entering large tanks or reservoirs which had been recently emptied. The present investigation has been undertaken owing to the death of one of the members of a rescue party of the Bureau of Mines, U.S.A., who entered a gasoline storage tank while wearing a respiratory apparatus supplying oxygen. Experiments, made upon men, show that breathing a mixture containing 2 to 2.5% of gasoline vapour renders a man dizzy, even when there is a high concentration of oxygen. The dogs have been placed in glass chambers of a capacity of 11 cubic feet. A stream of air of 20 litres per minute has been passed through the chamber. Measured amounts of gasoline vapour have been added to the stream of air. Samples of air drawn from the chamber at intervals have been analysed to obtain the concentration of gasoline vapour. The effects produced upon the dogs have been, in the first place, signs of discomfort, later, the onset of convulsions, still later, immobility, finally anæsthesia and death. In the different experiments, the rate at which the concentration of gasoline vapour in the air of the chamber has been varied, in some cases the increase being brought about four or five times as rapidly as in other experiments. These experiments have shown that the various symptoms and signs depend upon the concentration of the vapour and have been almost independent of the time taken to reach any particular concentration. The signs of discomfort appear when the concentration of gasoline vapour is about 80 parts in 10,000 of air. Convulsions occur when the concentration of vapour reaches 100 parts in 10,000. Immobility has been noted when the concentration reaches 160 parts in 10,000 of air. Anæsthesia has been observed when the concentration reaches 230 parts in 10,000 of air and death has not taken place until the concentration has reached 240 parts of gasoline vapour in 10,000 of air.

UROLOGY.

(143) Bladder Symptoms Due to Ureteritis.

G. L. Hunner (*Journal of Urology*, December, 1920) pleads for a more careful search for an organic origin before labelling distressing bladder symptoms of obscure cause a "neurosis of the bladder." It has long been known that a tuberculous kidney or ureter may cause severe reflex bladder symptoms, without the existence of the slightest vesical lesion. In addition, it has been discovered that those frequent sequelæ of gonorrhœa, chronic urethritis and chronic trigonitis, are responsible for many cases of so-called "irritable bladder." The author wishes to remove a third group of cases, which are of ureteric origin, from that limbo of ignorance which is commonly dubbed "bladder neurosis," in the hope that a rational line of treatment may be worked out. He has previously reported cases of vesical distress due to chronic urethritis arising from focal infections in the tonsils, accessory sinuses or teeth. He has also described a rare type of bladder ulcer due to such focal infections. His more recent experiences with cases of ureteral stricture and ureteritis convince him that many of these lesions are likewise due to focal infections. The ureteral lesion may cause the utmost vesical distress and if the ureters are not explored the cause of the trouble is very likely to be overlooked, especially as the urine may be free from pus and quite sterile on culture. It is usually the lower part of the ureter which is affected, the lesion being an infiltration of the wall which causes narrowing of the lumen. Treatment by dilatation (best performed with the wax-bulb catheter) is unavailing until the primary focus in the tonsils, sinuses or teeth has been removed.

(144) Bacillus Coli Infection of the Urinary Tract in the Female.

C. W. Bethune (*Urol. and Cutan. Review*, November, 1920) has investigated the route of infection in cases of *B. coli* pyelitis which, in both children and adults, is usually the precursor and the cause of the cystitic symptoms of *B. coli* infection. The infection of the kidney may frequently be hæmatogenous but it has been shown that there is a direct lymphatic connexion between the right kidney and the adjacent colon. This is important as it is the right kidney which is most frequently affected. "Colon pyelitis" is commoner in the female than the male; possibly this is explained by the greater frequency of intestinal stasis in the former. Many cases of recurring cystitis in adult females, if traced far enough back, would show an origin in pyelitis in infancy. The cystoscope, when inserted into the bladder during an acute attack, shows a congested mucosa, sometimes associated with bullous œdema, and the ureteral orifice of the affected side is swollen and pouting. Catheterization of the ureters allows the demonstration of pus in specimens from one or both kidneys, usually only the right. A stricture of the ureter is often found on the affected side. The phthalein output is only slightly affected in pyelitis, but is often nil when obstruction has led to the development of pyonephrosis. Enlargement and tenderness of the kidney in pyelitis may simulate pyonephrosis; in such cases the phthalein test is valuable in the differential diagnosis. The intestinal stasis should be combated, surgical measures being carried out if necessary. Magnesium salicylate (one gramme, three times daily) is the best intestinal antiseptic in these cases. Pelvic lavage and autogenous vaccines should be tried. Any obstruction or kinking of the ureter should be remedied.

(145) Treatment of Bladder Tumours.

B. A. Thomas (*Journ. Amer. Med. Assoc.*, November, 1920) has made an analysis of 62 cases of tumour of the bladder treated by various methods. He states that the cystoscope is all-important in the investigation of the nature of a bladder tumour and in determining the best form of treatment. The treatment, *par excellence*, of innocent papillomata, single or multiple, is high frequency fulguration. For early and favourably seated carcinoma, partial resection of the bladder, with or without transplantation of the ureter, as the case demands, is the treatment. For carcinoma of the vesical neck, total cystectomy may, in exceptional cases, be justifiable. When the carcinoma is too far advanced for removal, it is best to fulgurate the tumour thoroughly through a cystotomy opening and to implant radium needles throughout the tumour bed, allowing them to remain for a period varying from six to eighteen hours. Sometimes this treatment is followed by intensive X-ray "cross fire." Of the total series of 62 cases, 32 are known to have been permanently cured or temporarily relieved of all symptoms. Of these 32 cases, 24 were papillomata, five were polypi, two carcinomata and one was a hæmangioma.

(146) Suprapubic Puncture of the Bladder.

Berne Lagarde and Ramos (*Journal d'Urologie*, August, 1920) deprecate suprapubic puncture of the bladder under any circumstances and present details of cases to prove the danger of this and the superiority of other methods of relieving an acute retention. The fine needle for suprapubic puncture was first used forty-seven years ago by Guyon, but this surgeon, though he advocated the method when catheterization was impossible, added that he rarely had to perform the manœuvre more than once a year in his large practice. The authors maintain that, whatever the obstruction may be, the bladder can be emptied by the natural route, given good technique, appropriate instruments and patience. When catheterization cannot be effected, the method of choice is to perform an urgent suprapubic cystostomy, which is simply a palliative intervention, and may be the first step of a second, immediate or remote operation. In the study of a large number of cases it is noted that patients are usually put into hospital either because the retention persisted after several punctures, or because the first puncture yielded nothing. In order of frequency the cause was the prostate, a stricture and a traumatic rupture of the urethra. In spite of the false passages made in fruitless attempts at catheterization, the authors were able, almost always, to pass a catheter in the prostatic cases when the patient had been punctured. In stricture, even the tightest, it is exceptional that, with method, gentleness and patience, one cannot insert a filiform *à demeure*. In cases of traumatic rupture of the urethra all attempts at catheterization are strictly contraindicated and are to be replaced by suprapubic deviation of the urine. When the puncture needle drew off nothing the patients were generally fat individuals; in such cases the fear of pushing the needle in too deeply was the cause of failure. The authors declare that the peritoneum is wounded by the needle more often than one might imagine. Surgeons who perform cystotomy often, have noticed that, even with distended bladders, the *cul-de-sac* of peritoneum frequently forms an anterior relation to the bladder. Complications not frequently observed are infiltration of blood or urine into the cellulo-adipose prevesical space. Cases are quoted in which large hæmatomata or collections of urine had to be evacuated by operation and it is stated that where cystotomy had to be performed after puncture, small quantities of urine were invariably found in the pre-vesical space.

(147) Urethro-Trigonitis in the Female.

Bransford Lewis (*Urol. and Cutan. Review*, November, 1920) declares that urethro-trigonitis is one of the commonest of female ailments, annoying to the patient, yet frequently overlooked as a pathological entity and allowed to pursue its course. The urine may be crystal-clear and free from pus, bacteria or blood, yet pain and frequency are the distressing symptoms. At cystoscopy the mucosa of the urethra and bladder is found to be unduly sensitive and the urethra is often very tight and even contracted. In the latter case 150 to 300 c.cm. of residual urine may be present and sometimes a *Bacillus coli* infection; the residual urine, when large in amount, may actually cause false incontinence. The mucosa of the urethra and trigone is deeply congested, the rest of the bladder being normal. The urethra must be completely anæsthetized with cocaine before any local treatment; the canal is then slowly dilated to 30 or 34 F. with Kollmann's dilator. This procedure is repeated twice a week until 40 or 45 F. is reached. The improvement is progressive and enduring. In infected cases, if the kidneys are diseased, it will be necessary to add to the above treatment occasional pelvic lavage. For this purpose an 8% silvol solution is recommended.

Obituary.

SAMUEL THOMAS KNAGGS.

On April 13, 1921, the distinguished career of Samuel Thomas Knaggs was concluded. He had retired from active professional work some years ago and for a considerable time the state of his health caused his friends and relatives much anxiety. During the past few weeks he sought the aid of his old friend and colleague, Dr. W. H. Crago; but human aid was powerless to ward off impending death.

Samuel Thomas Knaggs was born in Ireland in the year 1842. In 1848 his father brought him to Australia; his home was then situated in Newcastle. He went to school in that city and there laid the foundation for his future career. He then returned to Dublin, where he studied medicine. In 1870 he obtained the qualifications of the King and Queen's College of Physicians of Ireland and of the Royal College of Surgeons of Ireland. In the following year he passed the examination for the Fellowship of the Royal College of Surgeons and he also graduated in medicine and surgery with honours at the University of Aberdeen. In 1873, after his return to Australia, he secured the degree of Doctor of Medicine of the Aberdeen University. Before leaving Europe he visited Vienna and Paris and studied in some of their famous clinics. In January, 1872, he again set foot on Australian soil and immediately started practice in Newcastle. On the foundation of a sound education, an unusual intelligence and considerable aptitude as an observer, he gradually gained the reputation of being one of the most capable and reliable general practitioners in the Colony of New South Wales outside the capital city. His popularity among his patients was immense and he justified to the full the reliance they placed on him. For twelve years he gave his best services ungrudgingly to patients of all classes. His ambition, however, impelled him to leave Newcastle, with its limitations of opportunity, for the more fruitful fields of the metropolis. He had gained considerable experience as an honorary surgeon at the Newcastle Hospital. During the Newcastle period of his career he joined the New South Wales Naval Forces as Surgeon. Later he attained the rank of Fleet-Surgeon and in due course he received Victorian Decoration for long service.

In 1875 the Editor of the *New South Wales Medical Gazette*, Dr. Frederick Milford, resigned his position and Samuel Thomas Knaggs was appointed in his stead. It appears that this monthly magazine existed chiefly as the organ of the medical branch of the Volunteer Forces. It was privately owned, but has been described as a strong and vigorous journal, excellently managed. Unfortunately, it ceased publication six months after Knaggs assumed responsibility. He had, however, been strongly attracted by medical journalism during his short association with this publication; so strongly that two years later he started his own medical journal, called the *Australian Practitioner*. He carried out his editorial duties most admirably; but it is doubtful whether a sufficient demand existed in those days for a special New South Wales medical publication. The business side of the undertaking was unsuccessful and its proprietor and editor was compelled to "put up the shutters." This journal throws a considerable light on the quality of the man who brought it into being. The public health activities of the time in the Colony were crude and unsatisfactory. Samuel Thomas Knaggs recognized what was at fault and indicated the manner in which the defects might be remedied. Although his efforts were to a large extent unavailing, his pioneering work in this direction was remarkable and significant. It should be pointed out that he had served for a short period as health officer for the port of Newcastle.

In Sydney, as in Newcastle, he started as a general practitioner. His reputation, however, had preceded him and it was not long before he was asked to take a leading part in both the surgical world and the world of hygiene. He was appointed an honorary surgeon at the Royal Prince Alfred Hospital, a lecturer in clinical surgery at the University of Sydney and an examiner in anatomy and physiology of the Board of Technical Education. Later he accepted the position of medical officer of the Eduration Department and still later he became a member of the Board of Health of New South Wales. He was appointed honorary surgeon to St. Vincent's Hospital, Sydney.

His interest in the affairs of the New South Wales Branch of the British Medical Association dates from the initiation of the Branch. In 1886-7 he was chosen by his colleagues to fill the coveted position of President. At a later date he was elected Chairman of the Medical Section of the Royal Society of New South Wales and held this position for one year. In 1892 the late T. P. Anderson Stuart and Samuel Thomas Knaggs were chosen to be the joint Honorary Secretaries of the third session of the Australasian Medical Congress in Sydney. Notwithstanding exceptional difficulties, with which Knaggs had no direct concern, he performed the onerous duties entrusted to him in an admirable manner.

In the year 1895 the New South Wales Branch of the British Medical Association acquired by purchase from the late Ludwig Bruck the *Australasian Medical Gazette*, which had been established fourteen years before. The late L. R. Huxtable, Honorary Secretary of the Branch at the time, was one of the prime movers in this undertaking. The first issue appeared in January, 1895. The editors were Samuel T. Knaggs and Louis Ralston Huxtable for the proprietors and for the other Branches of the British Medical Association F. C. Connolly, of Brisbane, J. W. Springthorpe, of Melbourne, and H. Swift, of Adelaide. Huxtable died on July 30, 1895, and Knaggs continued as responsible editor until the year 1901, when he was succeeded by Dr. George E. Rennie. The six volumes of the *Gazette* stand as unassailable evidence of his ability as a medical journalist. The New South Wales Branch of the British Medical Association was further indebted to him and to Huxtable for their considerable contributions to the library.

After he relinquished the editorship of the *Gazette* he undertook a trip to Japan, where he gained much useful information, which proved of service to him in later years. That this trip was not entirely a holiday is shown by the fact that he obtained a licence to practise medicine in Japan.

In addition to his professional practice, his public work in hygiene, his activity as a teacher and his six years' editorship of the *Australasian Medical Gazette*, Samuel Thomas Knaggs found time to write a few books. Two of these works were directed toward the exposure of trickery in connexion with spiritualism and clairvoyance. Early in his career he had detected the fraud of an impostor bearing the name of "Dr. Slade." This individual professed to obtain written messages from the departed spirits of the friends of his dupes. Knaggs demonstrated that the messages were written under the table by the imposter's own foot. It was characteristic of the man that he could not tolerate dishonesty in any form. He himself was upright, sagacious and sympathetic. He made hosts of friends and in every case remained true to them. He was generous to a fault and extended his help far and wide. The young practitioner of his day recognized in Samuel T. Knaggs a wise counsellor, a staunch friend and a real support. The deep sorrow of his widow and many relatives is shared by a very large section of the medical profession in the Commonwealth.

Dr. W. H. Crago writes:

After an acquaintanceship with the late Dr. S. T. Knaggs, extending over 45 years, during 16 or 17 of which time (1884-1901) we were most intimately associated in practice, as colleagues in a private hospital, as members of the Council of the New South Wales Branch of the British Medical Association and in the conduct of the *Australasian Medical Gazette* (as Editor and Manager respectively), I would like to add my tribute to his memory.

Dr. Knaggs was a man of the most genial disposition, large-hearted and generous to a fault. As a friend he was loyal and incapable of doing anything mean. Nothing was too much trouble for him where he could do a kindly act to assist a friend or one in need of help. His advice and practical assistance were readily given to the younger men in the profession. It may truly be said of him that he upheld the best traditions of the profession in "doing to others as he would they should do to him."

Early in this century he went to a trip to the East and practised for some time in Kobe, Japan. On his return to Sydney he retired to a large extent from private practice and for the past seven years has lived in absolute retirement.

Dr. R. Scot Skirving writes:

I remember, more years ago than I care to recall, first meeting Samuel Knaggs. He had just settled in College Street as the successor to Dr. Schuette's practice. He came to Sydney already a mature man with a great and deserved reputation as one of the ablest all-round practitioners in the Colony. As a very junior member of the profession I had just put up my plate. I recall with pleasure the kindly interest he took in my success, the encouragement he gave me and not seldom the tangible help in taking me to patients to assist him or to give anæsthetics. Indeed, I think I say no more than is right when I state that I can recall no man in the profession who throughout his career showed more kindliness and help to his juniors than Dr. Knaggs. Jealousy was a feeling unknown to him and to him could never be applied Spencer's bitter lines on the great Lord Burleigh who ever held down youthful aspirants, that he was of that sort of successful man who

Broad spreading like an aged tree
Let none shoot up that nigh him planted be.

He was, indeed, far otherwise, for his kindness was not merely negative but positive. He went out of his way to do men good turns.

As to his professional merits in his day and generation in the fullness of his manhood he was a fine type of practitioner which the younger generation will not see again. He was keen, enthusiastic, devoted to his work and eminently capable. He was shrewd, wise and well-knowledged and with the wide experience gained in an industrial centre like Newcastle he had made himself a competent surgeon, one who was ready to tackle and to tackle successfully all the surgery common in the period of his prime. Indeed this was recognized when he came to Sydney by his election to the surgical staff of the Royal Prince Alfred Hospital and his appointment as a lecturer in surgery at the University. But it was, I repeat, as an extraordinarily well-read, experienced, all-round man that those of my generation will remember him. In his youth he wrote a graduation thesis on "The Musculature of the Hand" showing care, correctness and originality. I do not doubt if his lot in life had lain in a centre of intellectual thought instead of a busy commercial city that he would have enriched our profession with original work of a sound character. But this was not to be.

He was one of those who "toil terribly" in the daily "roast and boil" work of medicine and surgery. It must be given to few practitioners to have laboured so usefully in that strenuous field of study. We may truly say that Knaggs throughout his long life bettered the profession of which he was no undistinguished a member, that if the cure of the sick and hurt be the be-all and object of a doctor's life, few men have been of more value to the country in which he lived than the subject of this notice.

Apart from the professional aspect of his life's work, Knaggs was honourable, upright, generous to a fault and kind beyond what is common. If there be a final bar before which one day we all have to stand, we may rest assured that Samuel Knaggs will be of those who will be dismissed with honour.

Medical Societies.

MELBOURNE PÆDIATRIC SOCIETY.

The annual meeting of the Melbourne Pædiatric Society was held at the Grand Hotel, Melbourne, on March 18, 1921, Dr. A. E. Rowden White, the President, in the chair.

The annual report of the Committee was submitted. It contains a review of the work of the past year. Seven meetings had been held, at which patients and pathological specimens had been freely exhibited. All the meetings had been of a clinical nature except one, on which occasion Dr. R. L. Forsyth read a paper introducing a discussion on asthma.

In response to an invitation from the Victorian Branch of the British Medical Association to become associated with that body either as a subsection or as an affiliated organization, the Society decided to affiliate with the Victorian Branch of the British Medical Association.

The Committee placed on record their sense of indebtedness to Dr. Reginald Webster for the comprehensive reports of the Society's meetings furnished by him to *The Medical Journal of Australia* and expressed appreciation of the space accorded their transactions in the *Journal*.

The members were urged to endeavour to enhance the success of the meetings by contributing papers and exhibiting cases. It was announced that the meetings would be held regularly on the second Wednesday of the month during the forthcoming year.

The Committee conveyed its thanks to the Committee of Management of the Children's Hospital and to the Matron and nursing staff for accommodation and excellent assistance in the conduct of the meetings. An especial tribute of

thanks was accorded Sister N. A. Thomas for her untiring help in the carrying out of the clinical evenings.

The election of office-bearers for the ensuing year resulted as follows:

President: Dr. H. Hume Turnbull.
Honorary Treasurer: Dr. F. Hobill Cole.
Honorary Auditor: Dr. W. Atkinson Wood.
Honorary Secretaries: Dr. H. Douglas Stephens, Dr. J. W. Grieve
Members of Committee: Drs. A. Jeffreys Wood, S. W. Ferguson and A. E. R. White.

The annual dinner was held at the conclusion of the meeting. The chief guest was Dr. W. Atkinson Wood, who recently retired from the staff of the Children's Hospital.

The undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Rupert G. Arnott, Esq., M.B., Ch.M., 1920 (Univ. Sydney), Canowindra.
Ralph E. Weaver, Esq., M.B., Ch.M., 1920 (Univ. Sydney), Lewisham Hospital, Sydney.
William K. W. Flook, Esq., M.B., 1916 (Univ. Sydney), Mendooran.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A meeting of the Senate of the University of Sydney was held on April 4, 1921.

The degree of Master of Surgery was conferred *in absentia* upon Mr. Clyde Davis, M.B..

The following appointments were made:

Mr. J. Macpherson, M.A., B.Sc., M.B., Ch.M., as Lecturer in Materia Medica.
Mr. S. H. Stroud, F.I.C., Lecturer in Materia Medica to pharmacy students.

On the motion of Dr. Purser, Mr. F. Leverrier, B.A., B.Sc., K.C., was appointed Vice-Chancellor for the academic year 1921.

Saturday, April 30, 1921, was fixed as the date for the conferring of degrees.

Leave of absence from April 23, 1921, until the end of the year was granted to Dr. G. H. Abbott, who purposes visiting Europe.

Professor S. J. Johnston was granted six months leave on account of ill health.

A letter from the Department of Repatriation asking for the concession of half fees for bursary holders, children of deceased or incapacitated soldiers, was agreed.

Fifty-six applications were received for the position of Librarian of the Fisher Library, to which Mr. H. M. Green, B.A., LL.B., was appointed. Mr. Green had a very distinguished career at the University, graduating Bachelor of Arts with first-class honours in philosophy in 1902. Mr. Green subsequently won prizes for English essays and verse. The degree of LL.B. was taken in 1905 with second-class honours. Mr. Green, who is on the editorial staff of the *Daily Telegraph*, served with the Australian Imperial Force in France.

Mr. T. Iredale, B.Sc., was nominated for the Science Research Scholarship offered by the Royal Commissioners of the Exhibition of 1851 for the current year.

On the recommendation of the Professor of Chemistry, the title of Associate Professor was conferred on Assistant Professor Schofield, A.R.S.M., F.I.C..

Correspondence.

URETHRAL IRRIGATION.

Sir: I have read Dr. J. Forbes Mackenzie's article, "A Word About Urethral Irrigation," March 26, 1921, and Dr. J. W. Sutherland's letter (April 2, 1921) with interest.

The picture of a ping-pong ball bobbing about at the apex of a playing fountain of water is quaint, but it hardly applies in the case of urethral irrigation.

When the stream of water is cut off the ball falls with the dying stream. So in irrigation the majority of the débris comes out with the returning fluid when the nozzle is removed. Anything which has been swept back posteriorly or which has been lightly caught on the wall of the urethra is washed out when the filled bladder is emptied at the end of the irrigation.

There should not be much loose débris to sweep back if the patient has passed his urine immediately before irrigation.

The only danger of the irrigation as a method of treatment is that one may use too great a pressure and so force some minute fragments of infected débris into some of the nooks in which the urethra abounds. This danger is overcome by having the irrigations supervised by a competent attendant. The medical profession need not fear intelligent urethral irrigation; it is quite safe.

I have used the irrigation method in many thousands of cases of gonorrhœa with few bad results. When I have had a bad result, I have nearly always been able to trace

it to one of three faults: imperfect sterilization of the nozzle, too great a pressure or too strong a solution.

Yours, etc.,

J. COOPER BOOTH.

283 Elizabeth Street, Sydney.
April 1, 1921.

Sir: In reply to Dr. J. Forbes Mackenzie's article "A Word About Urethral Irrigation," which appeared in *The Medical Journal of Australia*, March 26, 1921, I should like to defend the practice of urethral irrigation. I presume Dr. Mackenzie means posterior irrigation or irrigation of the posterior urethra.

There are two kinds of irrigation of the urethra—anterior and posterior. In the former the irrigation does not go beyond the "cut off" muscle. In this case the pus, etc., cannot enter the bladder. This manœuvre is used in the diagnosis of anterior or posterior urethritis. If the anterior urethra is washed out thoroughly and then the patient is made to pass his water, the urine will be clear, if no posterior urethritis is present.

My reasons for advocating posterior irrigation are:

(1) Posterior urethritis is extremely common. It is said to be less common in patients treated by posterior irrigations. It certainly occurs in untreated cases and those treated by injections.

(2) The pus (laden with gonococci, staphylococci and other organisms) and débris, microscopic and macroscopic, in posterior urethritis can drain only one way. That is, it must drain "up hill" into the bladder. This is against the canons of surgery unless Carrell's tubes are used. This is not practical in the case of the posterior urethra.

(3) As Dr. Mackenzie states the ping-pong ball is always at the peak of the jet in a fountain. Well, the pus, etc., in a urethra will probably reach the bladder first in a posterior irrigation. However, if this irrigation is properly given, it should follow the act of micturition which removes the bulk of the pus, etc., and should also follow an anterior irrigation, which removes at least most of the anterior urethral pus which may remain after micturition.

Practically speaking it is only the pus from the posterior urethra which enters the bladder. It does this, however, without any posterior irrigations as it always drains back into the bladder, if left alone.

(4) Without posterior irrigation and probably to a less extent with posterior irrigation in cases of posterior urethritis the pus containing gonococci will remain in the bladder for some time. However, the acid urine is inimical, if not fatal, to the gonococci. True gonococcal cystitis is rare and is generally a case for the undertaker rather than the surgeon.

(5) The best argument for posterior irrigation is urethroscopy. If this is done effectively, it should be done when the patient has held his water for some time. If done after a well-given posterior irrigation (especially with permanganate of potash), the whole aspect of the urethra is changed and often no useful information can be obtained. Generally no pus whatsoever can be seen.

(6) If carefully done patients improve under this treatment.

(7) Posterior urethritis is serious, as it is in the posterior urethra that absorption takes place. Posterior urethritis is present when gonorrhœal rheumatism occurs and the many other complications of this disease. Posterior irrigation is the most rational treatment for this condition.

I should like to add in closing that if given clumsily in the wrong cases, bad results will be obtained. This, however, is the surgeon's fault, not that of the posterior irrigation.

Yours, etc.,

J. C. P. STRACHAN.

Creswick, Victoria,
April 8, 1921.

Sir: Dr. J. W. Sutherland, in the *Journal* of April 2, has been sufficiently interested in my note on urethral irrigation to make comment and has asked for an alternative treatment. The proposal to treat fractures without splints, excited for a long time the same question. We do not pack or irrigate the throat of a sufferer from pharyngitis. The sufferer, unless an absolute throat juggler, thinks he is irrigating his throat when he gargles. He is usually just moistening his tongue and palate.

My proposal is to do without irrigation, as it does no particular good and probably does harm. The irrigation parlour has become quite a money-making institution in our larger cities and its crop has not come to harvest yet. One harvest has been sown and is being reaped; but I mean the harvest of urethral complications.

Thirteen years ago, when I was in the Royal Army Medical Corps, the gospel of irrigation was being spread by circular and army order. It fell to my lot to take over a ward of well-irrigated and rigidly treated sufferers from gonorrhœa—fifteen in all—and they had nearly all the 21—I think that is the number—complications. My mind, eager and receptive, got such a shock that it has never since recovered from the irrigation antipathy which invaded it and I have never irrigated the urethra in my life. Dr. Sutherland, I am afraid, will say at once that I don't know enough about it to express any opinion.

What really impelled me to write on this subject was the description by patients of the somewhat careless and risky method of irrigation practised at venereal diseases clinics.

Figures from Army Medical sources certainly must be considered, but personal communications from returned men regarding these very figures do not re-assure one as to their accuracy. At any rate, the conditions under which soldiers and civilians are treated are so different that one can only regard seriously the conclusion from a military source that complications increase in direct ratio with active local treatment. This, unless I misread the article, was the conclusion of Major Potter, A.A.M.C., published in this *Journal*, date forgotten.

The method with which I am satisfied, is rather an inactive one. Secure free drainage, forbid the usual bag; but order the soft cloth or gauze square with a hole in the centre. This, attached to the organ, allows pus to ooze away without hindrance.

Frequent washing of glans and meatus with 1-10,000 biniodide solution and promotion of free diuresis by fluids and a diuretic mixture containing a small quantity of urinary antiseptic. This mixture may or may not help, but the patient expects it.

I am most particular to forbid cigarettes—a very practical point, as a few of the old hands will tell you. I learnt this from a patient.

When discharge well established and all acute symptoms subsided, an autogenous and preferably detoxicated vaccine is administered. Under this treatment, with a moderate amount of rest and without any intra-urethral treatment, most gonorrhœas will clear up.

Persistence I regard as due to infected lacunæ and glands of Littré and the direct application of organic or inorganic silver preparations is made to the first inch and a half to two inches of the urethra, with great precautions against forcing further back in any way the fluid applied.

Yours, etc.,

J. FORBES MACKENZIE.

April 9, 1921.

THE SYDNEY UNIVERSITY MEDICAL SOCIETY.

We have been asked to announce that the annual general meeting of the Sydney University Medical Society will be held in the New Anatomy Theatre at the University of Sydney on Friday, April 15, at 7.45 p.m.. The business will include the presentation of the annual report and balance sheet and the election of the office-bearers. Dr. Fourness Barrington will address the meeting on the principles of medical ethics. Medical graduates are invited to attend.

The proposal has been made by the President of the Republic of Panama, Dr. Belisario Porras, to found an institute of tropical and preventive medicine as a memorial to the late General W. C. Gorgas, whose fame for his achievements in preventive medicine is spread throughout the world. A well organized laboratory, in which research will be carried on in tropical medicine, is to be established immediately at the Santo Tomás Hospital at Panama and a permanent building, to which the laboratory will be transferred, is to be erected in due course.

Books Received.

MEDICINE FOR NURSES, by John Henderson, M.D., Ch.B., F.R.F.P.S.G.; 1921. London: Edward Arnold; Crown 8vo., pp. 263. Price, 8s. 6d. net.

THE FORM AND FUNCTIONS OF THE CENTRAL NERVOUS SYSTEM: An Introduction to the Study of Nervous Diseases, by Frederick Tilner, M.D., Ph. D., and Alsop Riley, A.M., M.D., Foreword by George S. Huntington, Sc.D., M.D.; 1921. New York: Paul B. Hoeber; Crown 4to., pp. 1,020, with 763 illustrations, of which 56 are coloured. Price, 12s. net.

APPROVED TECHNIQUE OF THE RIDEAL-WALKER TEST, by Samuel Rideal, D.Sc., and Captain J. T. Ainslie Walker, .A.M.C. (T.F.); 1921. London: H. K. Lewis & Company, Limited; pocket size; pp. 12. Price, 1s. net.

A COMPEND OF DISEASES OF THE SKIN, by Jay Frank Schamberg, A.B., M.D.; Sixth Edition; 1920. Philadelphia: P. Blakiston's Son & Company; Crown 8vo., pp. 314, with 119 illustrations. Price, $2.00 net.

PRACTICAL TUBERCULOSIS: A Book for the General Practitioner and Those Interested in Tuberculosis, by Herbert F. Gammons, M.D., Introduction by J. B. McKnight, M.D.; 1921. St. Louis: C. V. Mosby Company; Post 8vo., pp. 158. Price, $2.00 net.

THE MICRO-ANALYSIS OF POWDERED VEGETABLE DRUGS, by Albert Schneider, M.D., Ph.D.; Second Edition; 1920. Philadelphia: P. Blakiston's Son & Company; Royal 8vo., pp. 548, with 237 illustrations. Price, $5.00 net.

ANATOMY OF THE BRAIN AND SPINAL CORD, by J. Ryland Whitaker, B.A., M.B.; Fifth Edition; 1921. Edinburgh: E. & S. Livingstone; Crown 8vo., pp. 262, illustrated by 103 figures. Price, 12s. 6d. net.

THE STORY OF THE HORON (COUNTY OF LONDON) WAR HOSPITAL, EPSOM: Its Conception and Work and Some Reflections, by Lieutenant-Colonel J. R. Lord, C.B.E., M.B., Officer Commanding; 1921. London: W. Heinemann (Medical Books), Limited; Demy 8vo., pp. 264, with illustrations. Price, 12s. net. Library Edition, 15s. net.

Medical Appointments.

Dr. G. E. Aitkin (B.M.A.) has been appointed Assistant Medical Officer at the Mental Diseases Hospital, New Norfolk, Tasmania.

It is announced that Dr. S. R. Burston (B.M.A.) has been appointed Honorary Assistant Physician at the Infectious Diseases Block of the Adelaide Hospital.

Dr. T. G. Allen (B.M.A.) has been appointed Government Medical Officer at Dunedoo, New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xxvii.

Department of Defence: Director General Army Medical Services.

Department of Defence: Medical Officer for the Central Flying School, Laverton, Victoria.

University of Adelaide: Professor of Zoology.

Alfred Hospital, Melbourne: Clinical Assistant to Out-Patient Surgeon.

Medical Appointments.

IMPORTANT NOTICE.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C..

Branch.	APPOINTMENTS.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIA. (Hon Sec., Medical Society Hall, East Melbourne.)	All Institutes or Medical Dispensaries. Manchester Unity Independent Order of Oddfellows. Ancient Order of Foresters. Hibernian Australian Catholic Benefit Society. Grand United Order of Free Gardeners. Sons of Temperance. Order of St. Andrew. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Australian Natives' Association. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIA. (Hon. Sec., 3 North Terrace, Adelaide.)	Contract Practice Appointments at Renmark. Contract Practice Appointments in South Australia.
WESTERN AUSTRALIA. (Hon. Sec., 6 Bank of New South Wales Chambers, St. George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND: WELLINGTON DIVISION. (Hon. Sec., Wellington.)	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

Apr. 19.—N.S.W. Branch, B.M.A., Executive and Finance Committee.
Apr. 20.—W. Aust. Branch, B.M.A..
Apr. 22.—Q. Branch, B.M.A., Council.
Apr. 22.—Western Med. Assoc. (N.S.W.).
Apr. 26.—N.S.W. Branch, B.M.A., Medical Politics Committee; Organization and Science Committee.
Apr. 27.—Vic. Branch, B.M.A., Council.
Apr. 28.—S. Aust. Branch, B.M.A..
Apr. 29.—N.S.W. Branch, B.M.A..
May 4.—Vic. Branch, B.M.A..
May 6.—Q. Branch, B.M.A..
May 10.—Tas. Branch, B.M.A..
May 10.—N.S.W. Branch, B.M.A., Ethics Committee.
May 12.—Vic. Branch, B.M.A., Council; Election of Representative on Representative Body.

EDITORIAL NOTICES.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to *The Medical Journal of Australia* alone, unless the contrary be stated.

All communications should be addressed to "The Editor," *The Medical Journal of Australia*, B.M.A. Building, 30-34 Elizabeth Street, Sydney. (Telephone: B. 4635.)